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'*Knowledge is proud that he has learned so much,*
Wisdom is humble that he knows no more.'—COWPER.

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FREE SCHOOLS.

BY THE HON. E. LYULPH STANLEY.

IN discussing this question in a journal for teachers we are mostly concerned with the effect that free schools may have in improving or injuring education.

Whether free education will injure or benefit Voluntary Schools may be a matter of supreme importance to politicians, but the only question we are concerned with is their relation to efficiency. On this point the first thing on which we have to dwell is, that if a school be made free it should be made free throughout all its classes.

The analogy of Scotch legislation, and Mr. Goschen's observations in his Budget speech, all point to the probability of the proposals of the Government excluding the upper Standards from the operation of their bill.

Should this be the case, serious injury will be done to education. On this point we have a concurrence of testimony from those interested in schools, regardless of party. The National Union of Teachers resolved that 'It is desirable, if a system of free education is introduced, that the freedom from payment of fees should extend to the whole period of school attendance.'

The experience of Scotland shows that the imposition of fees above the Fifth Standard has injured the upper classes in that country. The Edinburgh School Board, in a report of 15th December, 1890, stated, 'It can no longer be doubted that the freeing of the compulsory Standards from the paying of fees, through recent legislation, has up to this date had a detrimental effect on the attendance in the upper Standards; and this effect will become more marked as time goes on, unless something is done to counteract it. As may be gathered from excerpts of the reports of head masters, which follow, there are many parents who will not now enter their children in the VI. and ex-VI. Standards, because of their being required to pay fees for them in these Standards.' The *School Guardian*, the organ of the National Society, takes the same view, and dwells on greater importance of freeing the upper classes than the lower, if we are to have any kind of free or assisted education. Teachers and inspectors have alike deplored the practice of raising the fee with the Standard, as tending to drive children prematurely from school. The imposing of a fee where no fee existed will have a still more injurious effect in the same direction. Supposing that the Government grant be only adequate to compensate for the loss of fee in the compulsory Standards, the right of managers to free their schools throughout cannot be denied. In that case the large Boards would probably establish a completely free system and bear the moderate loss of fees. Voluntary managers would be in some difficulty as to doing the same thing, for they have not the rates to fall back upon, and cannot easily raise their subscriptions.

If, therefore, the Government did not provide for freeing the whole school, the voluntary schools would be the chief sufferers, as their scholars would in many cases leave them when they reached the upper Standards in order to profit by the free education of the School Board.

In the interest, therefore, of the Voluntary schools, as well as of school efficiency, any scheme should secure freedom from fees throughout the entire school course.

The question is debated—How will free schooling affect the attendance? Will it improve it, injure it, or leave it as it is? On the one side, it is urged that what people do not pay for they do not value, and that at present the scholars in high-fee'd schools attend best. On the other side, appeals are made to the exceptionally high rate of attendance in such schools as the Manchester Free School, and to the evidence given by Mr. Williams, Superintendent of Visitors in East Lambeth (Education Commission, Vol. 2, page 920, Q. 40,956—63), showing that the average attendance of scholars whose fees were remitted was 82·6 per cent. as against 78 per cent. for all scholars, whether paying or not paying. Mr. Williams' conclusion is that the abolition of fees would improve attendance.

On the whole, we believe that the abolition of fees would improve the attendance, though not to any marked degree. The causes of irregular attendance go far deeper than the question of finding the weekly pence. The principal causes are the poverty and indifference of parents—poverty which compels them to use the services of their children at the expense of their schooling, indifference which makes them use the children to save themselves some little inconvenience. If the attendance at school were only interrupted by truancy or ill health, the average attendance would probably be something like 93 or 94 per cent. of the roll; the present 78 per cent. of the roll, which represents the common average, is

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due to avoidable causes. No doubt in some cases the exclusion of a child on non-payment of the fee leads to irregularity, but that cause does not operate in the Board Schools of London.

If public opinion in England were on the level of Germany, Switzerland, Holland, and some other countries, if those who enforce the law in England would do their duty uniformly and strictly, there would be a marked improvement in school attendance. But after all we do not as yet make full use of the persuasive forces which make for good attendance. Experience shows that in one school the attendance varies greatly in different classes, pointing to the personal influence of the teacher as a very great factor in securing good attendance. The attractiveness of a particular lesson tells a similar story. It is well known that the percentage of attendance at the cookery lessons in the London Board Schools is distinctly higher than the general attendance of the girls, although the distance to the cookery centre is greater than the average distance to the school.

One great means of securing good attendance has been a regular system of school meals. Sir Henry Peek's experience in Dorsetshire is most striking on this head, and the writer has lately heard of a case in a Hampshire village where the distribution of soup daily through the late hard winter secured a nearly absolutely regular attendance.

On the whole, those who look for an improvement in attendance, from free schooling, of more than 2 or 3 per cent. are probably over sanguine. One effect will probably follow—the willingness to send scholars who have failed to attend for a day or two, for the broken fragment of a week. At present, if the first two days of the week are lost, it is probable that the whole week will be blank of attendances.

Some persons threaten us with a social deterioration in our elementary schools if they are made free. We hear that the better class of those who use the public elementary schools value the power of selecting associates now afforded by the varying fee. And we are threatened with a great revival and extension of private schools at high fee, where the parent will secure exclusiveness at the cost of efficiency. Thus the Rev. W. T. Jones, Rector of Prestwich, Lancashire, writes to the *Standard* of May 8th, 'that through dislike of free schools parents will send their children to a private school where the fees are higher, the secular instruction inferior, and the religious teaching too often *nil*.'

No doubt this feeling exists to some extent, but much less than formerly. It still exists more for girls than for boys, but there is no doubt that in the long run, with this class of persons, efficiency will beat exclusiveness. In some districts of London the more well-to-do parents send their children to a Board school at a little distance, passing by equally good Board schools nearer their home. This social shyness must wear off, and the Board schools, free or not, will every year be more and more recognised as what they are, the schools of the nation.

Another argument against free schools is this: that whether free schools be good or bad, the principal need for education at this moment is not to cheapen it to the parent, but to make it more efficient; and if we burden the State with a charge of £2,000,000 a year in substitution of what the parents now pay, we shall make it more difficult to raise any substantial sum for the improvement of education; and the community will insist that if education is gratuitous it shall be limited to the barest elements. If this argument were likely to prove true it would be worthy of the most serious consideration; but we do not find that in those countries where education has been made gratuitous public interest in it has diminished; on the contrary, the freeing of the schools is itself an evidence of the growing desire of the community to put no obstacles in the way of the full development of the faculties of the young. The more the community pays for education the more interest it takes in it, and this interest is a pledge of the determination to make it as good as possible.

It may perhaps seem idle to argue the merits of free education when both parties have agreed to promote it. But unfortunately there is no reason to think that the Conservative party is any better disposed to the principle than it was a few years ago, when this proposal was denounced as a socialist and subversive proposal of men whose advocacy was said to be really the result of their desire to abolish the denominational schools.

And indeed the utterances of Conservative speakers and Conservative newspapers are as a rule to this effect. Free education is a bad thing, but we cannot escape from it. It is also a good election cry; let us therefore do this bad thing ourselves rather than leave it for others to do; we shall then get a splendid election cry and we shall be able to so fashion the bill as to make it beneficial to Church schools, whereas if we leave it to others they will injure the Church at the same time that they pauperise the people.

It is a little singular that the payment of a fee should be thought so salutary in the day school, especially by those who claim to be the champions of religious teaching. We do not find that the system of pew rents is considered a satisfactory arrangement in the churches maintained by the State for the religious education of the nation, nor have we ever heard it proposed to establish a fee for attendance at Sunday schools; and yet, if the fee is in itself a useful influence and one that tends to the advantage of the scholar, some persons should be found imposing it and urging its general imposition in the case of the Sunday school and the church.

The fact is that the imposition of fees was natural when education was a matter of private interest, and supported by private funds; but now that it has become a matter of public concern, and is to be supported almost entirely by public contributions, fees seem as unreasonable as turnpikes on public roads or a toll for entering the National Gallery or the British Museum.

Free schools mean public schools, as free roads, free parks, free gas, free police mean public maintenance and public management for these useful equipments of our municipal life.

It is suggested by some that the Government may offer a kind of local option in the matter of free schools, leaving the managers of high-fee'd schools to go on levying fees if they will.

This would be impracticable, and even if allowed to some extent must be a short-lived compromise.

Clearly an average grant in excess of the fees hitherto collected in the low-fee'd schools is an excessive expenditure of public money, unless we secure a free school system throughout the country. If we are to pay an average price we must have the whole system made free, or we shall not get our money's worth. Besides, no one could imagine that an individual voluntary manager in some village could be allowed to decide whether the

people of the village shall or shall not take advantage of the liberality of Parliament. Even in towns where there is a choice of schools, an injury would be done to the people in any one locality if the school most accessible to them continued to levy fees, and their young children were to be driven across dangerous thoroughfares to find free schooling.

What would the people of Westminster and Paddington care, if the Church schools, which have the practical monopoly of the districts, continue to levy fees, that in Bethnal Green or Walworth there are Board schools open free of charge? The free school must be the school at your door, the convenient school, and no partial system of free schools will last long.

The fact that any grant in lieu of fees must be based on the average fee of the country is now generally admitted. Even the Wesleyans, who will suffer more than any other, by an average grant, admitted at their Conference that this was the only practical method. The writer in the *Quarterly Review* of January last made the same admission. He stated that any attempt to graduate the sum allotted to meet the amount previously paid to the school for fees would be obviously unstatesmanlike, as it would be giving much to those who needed it the least, and little to those who most required it.

So, too, it has been suggested that high-fee'd schools might receive a grant in reduction, if not in extinction, of their school fees. The same *Quarterly* reviewer says of this proposal:—'To us such a scheme seems neither just nor practicable. If parents are very poor, and exemption from even a small school fee is a matter of importance to them, something may be said in favour of making the school free; but if a parent can afford to pay 4d. or 6d. a week for his child's education, we see no point in compelling the taxpayers of the country to provide the half or a third of that sum, that the well-to-do parent may have his pocket spared to an equal extent.'

The fact is, that those managers who have charged low fees have been making considerable local efforts by subscriptions and rates, and are entitled now to have their positions equalised. Managers who have charged high fees have taken advantage of the unrestrained power conceded to them by the law, and have yearly raised the fees charged to parents, while at the same time their own contributions have been reduced. The Birmingham Board, and Roman Catholic managers generally, have taught the poor, charging them low fees. The Preston Church managers were levying 15s. 7¼d. on each child, and subscribing themselves 4d. Would it be reasonable to make the neglect of duty of Preston managers, who have farmed their schools for nearly 30 years, a reason why they should receive from the taxes 15s. a head on their scholars, and Birmingham only 5s. 6d., thus perpetuating at the public expense the neglect of duty, which has lasted too long? Or, again, in Preston itself, should the Roman Catholic schools, whose managers have paid from their own pockets more than 11 shillings per child taught, be worse treated than the Church schools with their voluntary effort of 4d. a head? Again, how could any one propose that the Preston parent should still pay 5s. a head for his child's schooling because he has been subject for years to the unchecked exactions of the local managers and teachers, while in other towns the people reap the full benefit of a free school system?

A uniform grant in lieu of fees, based on the average fee income of the country, is the only tenable solution. It may press on some schools, whose managers have hitherto enjoyed the power of managing without bearing any substantial part of the burden of the cost, but it will enable the conscientious and painstaking managers, who have levied light fees, and raised substantial contributions, to come with increased resources to the task of improving the quality of their school teaching.

One more point should be noticed as to free schools. The fee income, as tabulated in the Blue Books, includes the money collected for books and apparatus. It is, therefore, clear that if the State pays to the managers a grant based on this income it should insist that the schools should be freed in reality, and that no charge for books, or for extra teaching, can be permitted.

The political questions of management so intimately connected with the changed conditions resulting from further public aid, amounting to £2,000,000 a year, must come up for prompt settlement, even if the Government attempt to keep them apart for the moment. One word, however, may be said on what kind of public management would be beneficial to education and what kind would be less desirable.

There is a general consensus of opinion that the parish is too small a limit for proper school management. There is a difficulty often in getting enough educated persons to make a good committee, the smallness of the area gives undue power to individuals, the management of a single school deprives the managers of the opportunity of comparing various schools and thereby acquiring knowledge of the subject they are concerned with.

There is a strong consensus of opinion in the United States, where for some years sub-divided school districts were created having the management of single schools, that there was need for reverting to larger areas containing several schools.

Any proposal, therefore, which retained the present parochial areas unenlarged would be bad for education. Still worse would be any sham proposal for quasi-public management, by which the parents sending children to a particular school would elect managers to that school.

We should thereby get the very smallest and narrowest group with the most limited ideas. We should have no assurance that even the parents would be adequately represented, since there would be no register, no arrangement for summoning them, nor for taking a poll. Again while it is very desirable that the class who use the schools should have a voice in their management, yet we do not want to exclude the local community as a whole. A mere representation of the parents would not bring the school within the scope of local municipal institutions, a position it occupies in nearly every civilized community except England. Any proposal to associate parents in the management, as a means of staving off public management, would be either illusory or irritating. The direct management of parents undiluted by the representative voice of the whole community spread over a sufficient area, would probably, where it was effective, tend in many instances to weaken discipline and injure the influence of the teacher.

An area, such as the Wesleyans ask for, of 8,000 or 10,000 inhabitants would protect the teacher of any one school from unfair pressure, and secure that complaints would be considered impartially. A village committee of parents, led perhaps by the village orator, whose child might have been righteously corrected, might often make the life of the teacher unbearable.

We know that the Conservative party is not friendly to this local municipal control. Those who are not friendly to a principle are not likely to be happy in their mode of applying it; let us, therefore, be on our guard against the intrusion of the parental committee, and rather wait a year or two for real public management than accept a clumsy and quarrelsome substitute, where the old clerical element may be involved in war with a new body of impatient and uneducated critics.

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WHAT DOES FRÖBEL TEACH US?

BY EMILY A. E. SHIRREFF.

President of the Fröbel Society.

It would be curious to inquire among the numerous professed admirers of the Kindergarten how many could answer the question with which we head this article. The popularity of the practical system increases, larger and larger numbers of teachers are yearly required, Infant Schools are becoming modified by it, mothers send their children to handle the gifts and learn the games, and rejoice to see their little ones so happy over them; and yet if we ask what Fröbel has taught us, and what we are teaching the children through him, I fear that the proportion of those who could give a reasonable answer would be small. Let us then consider this matter. What really is the debt we owe to him? Has he opened a new science, and so enlarged the borders of our knowledge? Has he discovered new laws in the mental or physical world? Does he open up new sources of wealth, or throw new light on the political or social questions that create so much strife among us? These are the things men care for, and he brings none of these. What teaching then has he brought? *A new principal of education*—simply that, no more; but a new principle that, once apprehended, shows up all the feebleness, all the error of the old. He teaches us, first, *what education is*, and therefore what we may expect from it; and secondly, how this true education must be conducted if it is to bear its proper fruits.

Most people think we have known all about education for centuries, and doubtless much has been said and written about it by wise and able men, from the philosophers of the olden time to those who have constructed all the school systems of modern days; but the highest, the most universal principle, was not laid down by them, and though approached by some, and even claimed by Rousseau, Fröbel was the first to set it forth at once in all its fulness and in all its simplicity. What he teaches us is, that *education is the development of the child's whole being according to Nature*, the growth as of a plant from root to stem and flower, guarded and directed by the care and knowledge of those to whom that precious human plant is trusted, and thence the name of Kindergarten—a garden of children—which he gave to the peculiar Infant School he instituted for the practical working out of his theory in infant training. Many persons have thought the name signified a *Children's Garden*, implying that a piece of garden ground was an essential portion of the plan; so much so, that one French writer thought he had settled the question of the impracticability of the system for Paris, since there, no garden ground could be obtained! Most desirable it is to have a garden in connection with a Kindergarten, but the name means simply, as I said above, the spot where the human seedlings can be planted out, watched, and cherished, while they grow and shoot, gather strength and beauty, as do the plants, according to the laws of their nature, *i.e.*, according to the laws of God, as made manifest in the constitution He has given to His human creatures.

This then is the simplest and at the same time the most comprehensive expression of Fröbel's theory—*education according to Nature*. This is the principle which deserves to be called new, as set forth by him, because those who had announced it before have utterly fallen short in practical application, and generally in any such study of human nature as would have made a full and honest application possible. This, therefore, is the first thing he teaches us: 'The aim of the old education (to borrow words that I wrote long ago) is to fashion the human creature upon a certain model of moral and intellectual excellence, according to the condition of the individual and the times; but Fröbel knows nothing of definite models, he aims at the indefinite expansion of whatever faculties lie in germ in the child, leaving them when developed to find their work in the times and the circumstances. He does not say to the young creature, "Be this or that," but "Be the best thing it is in your nature to be." The old system sought to educate men for certain functions, certain modes of social utility, Fröbel would educate a man for the sake of the perfection of his own being, because his nature is like the nature of all other living things, destined to develop under given laws, and to produce a good or evil result according as that development is full and free, or thwarted and misdirected.'

Granted then that education is the process under which a child's whole being is to grow and unfold according to Nature, *our* work is sufficiently marked out. Nature is the guide, but the child cannot be left to itself. He is feeble and helpless, not like the young of the lower animals endowed with instincts that enable them to satisfy their own wants as soon as they have the free use of their limbs, which use they acquire, as we know, at an age when the infant is still utterly powerless. This lengthened period of helplessness in the case of the human creature is itself one of the most beautiful provisions made by nature for its future superiority; for the need of parental love and care are thereby prolonged, family life is founded, and all that is durable and elevating in social life centres there. A moment's contemplation of the feeble being provided by nature with a home, makes the duty of education obvious, and the nature of the educator's task no less so. We all know *something* of what is the wonderful constitution of man, with all its various capabilities of body and mind; and the student of education must know more, in order that seeing what should be the full stature to which our feeble nursling may be destined to grow, we may then study more closely the peculiar constitution of the child, to read therein what nature demands or indicates, to train the early germs of what the future will unfold, and learn to aid in unfolding them.

Fröbel's next lesson is that education is *harmonious development*; it must embrace the whole mental and physical nature; to divide is to enfeeble. We cannot, without dire mischief, isolate a group of faculties, as, for instance, the physical or the intellectual, and choose one for culture while neglecting the

other; the neglected body will lower the intellectual and moral activity—the neglected intellect will make bodily work mechanical, and lower the influence of moral character; while the neglect of moral discipline will, whatever the knowledge or the bodily perfection reached, lower the standard of the human being. Clearly then, if education is to be at once comprehensive and harmonious, it behoves the educators to have a distinct view of the scope and purpose of the different branches of the one great work, and thus to realise where they differ, and where they coalesce and vitally affect each other. As regards physical training, for instance, we must consider what, under favourable circumstances, would be the perfect working of our bodily frame, what this structure, 'so fearfully and wonderfully made,' really comprehends. First and foremost, health, which, though not always within our reach, depends most upon care and the knowledge of certain fundamental laws—next, the ready use of all the organs of sense, which, though, in like manner, not under the same control with all, are far more than we generally believe within reach of due cultivation—compare the eye, the ear, the hand of those who have and those who have not trained their power, and we seem to be dealing with things as different as a common hammer, and a steam engine; a school boy's ruler, and an astronomical instrument. And as regards general grace and strength and beauty, compare the ploughman and the athlete, the fairy-like dancer and the uncouth country girl. Perfection of physical as of mental training will always be very rare, and the highest efforts must probably always be partial; but general training brings into prominence any peculiar aptitude, any bent towards peculiar forms of activity, and gives a well-balanced command of all that nature has bestowed.

With regard to intellectual training, it scarcely deserves the name if all the faculties are not disciplined; if, for example, reasoning or power of observation be set aside for the indulgence of memory or imagination. We may not say of any child that he will not need such or such a mental faculty, since whatever his work in life he will surely never find that Nature has been too bountiful. Unless we think it probable that some of us will remember too well, or reason too soundly, or observe too accurately, then we may well be glad to cultivate the full share of power that nature has made us capable of, and to exercise it among the things daily presented to us by our senses, and among the duties that belong to our station, be it humble or lofty. Lastly, and above all, is it true that in moral training we cannot safely choose one quality to cultivate while neglecting others. We cannot, without crippling our action and influence, be simply kind and humble-minded, and neglect justice and firmness of will; we cannot with impunity cultivate obedience, and forget the claims of individual conscience, and so on. Whatever is one-sided leans to error, and the education which rests on harmonious cultivation of the physical, moral, and intellectual nature, demands also the comprehensive cultivation of faculties belonging to those different provinces of our complex human constitution.

Were it not for the extraordinary facility of misapprehension it would seem needless to point out that what has been said above, in no way is meant to imply that Nature, who gives to all, gives *equally* to all; or that, even did capacity suffice, it would be possible to give equal cultivation to all; but only that the harmonious training should form an equal ground-work, on which the specialised labour of later years may rear its special superstructures. In other words, the educational training—that which gives to each human being the general use of his powers of mind and body—will have been equal for all; that all, in short, will have been taught, according to their capacity, to work and to reason accurately, to judge soundly, to direct activity with definite purpose, and to have a conscious aim of self-improvement; while the training for special worldly callings, which comes after, will differ according to circumstances and to natural gifts.

And now we must turn to the third principle that Fröbel teaches us: *Education according to Nature is continuous.* Occupations and instruction differ with age; but the human faculties continue to unfold according to natural laws, and the operation of these remains unchanged. Reason and imagination are the same faculties in manhood as in youth and in childhood; only their vigour, and the objects on which they are exercised differ. The affections and the conscience speak the same language to the heart of man whatever the period of life; just as the bodily organs remain intrinsically the same, though the eye delights in different forms of beauty, and the hand grasps the sword instead of the rattle; and it is on that sameness in the midst of change that the continuity of education is based. To quote my own words once more—'Fröbel knows nothing of finishing periods; with him the training given in early years naturally merges in self-education through later years. That it should do so is the express and ceaseless aim of the true educator. He trains the infant to become a healthy child, healthy in all its faculties of mind and body; the child, so that he may possess more and more freely all the powers of his nature; the youth to feel the duty and responsibility thus laid in his own hands, expanding in strength, in comprehension of duty and truth, in power of resolution, of action and endurance, ripening as years go on, but knowing no boundary to the upward striving, save that one ideal of perfection set forth in the Scriptures, which all must aim at, though none can reach. Doubtless, as said before, the old systems equally assume that such is the ultimate end of education, that a worthy manhood or womanhood must be the purpose of all youthful training; but we see little direct and continuous effort made for that distant result; while Fröbel never loses sight of it. Every step, as ordered by him, from the mother's watching over the cradle, till the task of education is laid into the hands of the grown-up responsible human being, prepares the way for the next step; no break, no pause being allowed to make one portion of life seem isolated from another, or governed by different principles. He has not, indeed, practically elaborated his system beyond the earlier periods; but his principles are clearly laid down, and when the time is ripe for their thorough adoption, there will be no doubt about their fit application to every stage of education.'

Nothing then can be more opposed to 'Fröbel' teaching than to talk of the Kindergarten method as *the* Fröbel education, as if he had parted off infant training from the rest of education, and established principles to be acted on then and laid aside when school life begins. He illustrated his views indeed in a system for infants, because education was more new, more untried then, but especially because the foundation must be laid then, before mistakes and prejudices, neglect or meddlesome care have marred the fair field we have to cultivate.

Fröbel's method, as exemplified in his infant training, is however too large a subject to enter upon here. I hope to return to it in a subsequent paper; but desired first to show what is the theoretical basis on which it is founded. When that is thoroughly understood the practical part acquires new life and meaning.

To sum up then what I have here endeavoured to show forth. We have seen, in answer to the question asked in the beginning, that Fröbel teaches us, 1st, that education must be according to natural laws; 2nd, that education is *harmonious development* of the child nature; 3rd, that education is *continuous;* and the necessary consequence from these three dogmas is, that true education is deeply religious, since the laws of nature are the laws of God.

Fröbel does not enter into church doctrines; but in his whole plan of education, as in the whole ordering of his own life, we see him guided by the abiding consciousness that in Him, whose laws we strive to decipher, we do indeed 'live and move and have our being,' and that truly to educate a human being is to aim without ceasing at increasing his fitness to serve God and man.

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ON THE TEACHING OF ELEMENTARY GEOMETRY.*

BY W. P. WORKMAN, M.A., B.SC.,

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IN order to decide upon the proper method of teaching any subject whatever, it is obvious that we ought to have definite notions as to our reason for teaching it at all, and that we ought to keep these notions clearly before us during our teaching, so that every stage of it may tend to their perfect realisation.

Why, then, do we teach geometry?

The objects of Mental Education are, I take it, in the main three:—

First and foremost—The opening of the Mental Eye to all the mystery of the world around, or, to put the matter otherwise, the awaking of the faculty of wonder, it being as true now as it was when those remarkable words were first uttered, that 'He that wonders shall reign, and he that reigns shall rest.'

Second—The due training of the Mental Eye, the abolition of Mental Colour-blindness, and Mental Astigmatism, and the acquisition of Mental Perspective.

Thirdly—The gathering, classification, and orderly arrangement of useful knowledge—knowledge, I mean, which is to prove itself useful in the acquisition of other knowledge, not in any sense knowledge which has its market monetary value, for I cannot admit that a subject like Book-keeping, to take one example of several that present themselves, which *(pace* Mr. Thornton) has but a paltry bread-and-butter utility, has any true place or part in a rightly planned Scheme of Education, and am, indeed, inclined to believe that the very utility, as distinguished from the usefulness, of a suggested subject of Education is in part its condemnation also.

Now Mathematics in the elementary stages can do but little towards the realisation of the first aim. The Wonderland exists, it is true, but it comes only after long and toilsome marches, which cannot be avoided by any short cuts whatever. 'There is no royal road to Geometry,' as Euclid himself told the great Ptolemy Lagos, when in search of a short cut thither for kings.'

But the Wonderland exists, I repeat, and its wonders repay the march. I venture to assert that the feelings one has when the beautiful symbolism of the Infinitesimal Calculus first gets a meaning, or when the delicate analysis of Fourier has been mastered, or while one follows Clerk Maxwell or Thomson into the strange world of Electricity, now growing so rapidly into form and being, or can almost feel with Stokes the pulsations of the light that gives nature to our eyes, or track with Clausius the courses of molecules we can measure even if we know with certainty that we can never see them—I venture to assert that these feelings are altogether comparable to those aroused in us by an exquisite poem or a lofty thought.

For the average schoolboy, however, these considerations are beside the mark. Possibly it is so equally for the average schoolgirl, though after recent results at Cambridge he would be a rash man who dogmatised on THEM. The Wonderland of Geometry, at all events, lies far beyond most of our pupils. You may tell them if you like that the same two points are common to every circle in a given plane, that draw your circle where you like you cannot get away from them, that these two points have many wonderful properties, as, for instance, that any tangent from them to an ellipse passes through a focus of that ellipse; you may hint at the possibility of Geometry of Four Dimensions, in which spheres can be turned inside out, and knots tied on endless cords. You may say all this, but your pupils won't believe you, and you won't render their mental horizon one degree the wider for all your trouble.

For much the same reason we are debarred from pleading the *third* of our Educational objects. Geometry is not of much use—save to the mathematician—as a basis for building other knowledge upon. But yet this *third* motive should not be altogether lost sight of. It will serve you in good stead with that awkward youth who is always sulkily asking you the wherefore of all these triangles, parallelograms, and circles. It is no use to tell him that they are whetstones for his wits. He is not aware that his wits need sharpening, nor would he greatly relish the prospect if he were. Indeed, he regards his discovery of the uselessness of Euclid as a proof of his already superior sharpness. So we may lawfully use lower motives with him. We may tell him that there is a Science of Trigonometry which is merely the Algebraical statement and expansion of Euclid i., 47. That it is this science which enables ships to sail in straight course, or St. Gothard Tunnels to be pierced so exactly, that engineers from Switzerland and engineers from Italy meet in the centre of the mountain within an inch or two after five miles of independent burrowing from opposite sides, and we can thus, *experto crede,* inspire the dullest with a kind of interest in his work.

But the teacher *must* regard the main function of Geometry to be Intellectual Discipline. Let us try to keep this clearly in mind that we may shape our teaching accordingly, and that we may be able eventually to grasp the reason of that strange inscription over Plato's door, *μηδεὶς ἀγεωμέτρητος εἰσίτω,* 'Let none unversed in

* A paper read before the Bath Branch of the Teachers' Guild May 5th, 1891.

Geometry enter here.' For rightly applied I believe that Geometry is the finest discipline ever invented for the mind of man, and that as the great D'Alembert remarks—'Geometry, which measures bodies, may serve, in certain cases, to measure minds too.'*

Let us now descend from the high ground of theory to the practical questions—what shall we teach, and how shall we teach it?

I. Shall Geometry mean Euclid, or shall it mean Euclid's 'Modern Rivals'?

I hope that I shall disappoint no one here when I say that I am sufficiently conservative to believe that for us, the teachers of the young, it ought to mean Euclid and not the Association Syllabus. Euclid has great and grave defects, some of which are easily removed, some of which are inherent in his method. These have been stated once for all by De Morgan† in his masterly article on Euclid's life and works. He 'never condescends to hint at the reason why he finds himself obliged to adopt any particular course. Be the difficulty ever so great he removes it without mention of its existence.' But the teacher can condescend, and the teacher can give himself the pleasure of mentioning the difficulty as a preface to the still more exquisite pleasure of removing it. 'He has not the smallest notion of admitting any generalised meaning of a word, or of parting with any ordinary notion attached to it. Setting out with the conception of an angle rather as the sharp corner made by the meeting of two lines than as the magnitude which he afterwards shows how to measure, he never gets rid of that corner, never admits two right angles to make one angle, and still less is able to arrive at the idea of an angle greater than two right angles.' This is a decided mistake, but it is one which is very easily corrected. And so we might continue, but we had better sum the matter up with De Morgan, the greatest mathematical *teacher* perhaps that has ever lived. 'These objections refer to matters which can be easily mended. No one has ever given so easy and natural a chain of geometrical consequences. There is a never erring truth in the results..... The strong inclination of editors to consider Euclid as perfect, and all negligences as the work of unskilful commentators or interpolators, is in itself a proof of the approximate truth of the character they give the work; to which it may be added that editors in general prefer Euclid as he stands to the alterations of other editors.'

We ought to adopt the Elements of Euclid, I say, partly because they are themselves exquisitely adapted to our purpose of mental discipline, partly because there is no hope whatever of any general consensus as to a suitable substitute, and partly because the book which was used 2,000 years ago in the schools of Alexandria has gathered a halo of associations round it, not, in themselves, devoid of educational value.

II. Whose Edition shall we use?

Need I say that no edition is perfect? We teachers understand each other, and we know that in his secret soul each one of us is firmly convinced that on his own particular hobby the perfect book will not have been written until he writes *Finis* at the end of his *magnum opus*. But on the whole the edition of Hall and Stevens (Macmillan) best realises my wishes. To this, however, the teacher ought to add, for his own private use, at least three other editions, namely, Mackay's* (W. and R. Chambers), which will supply him with a large assortment of the easy Riders, to which I shall subsequently refer, 'The Harpur Euclid' (Rivington), and 'The Elements of Plane Geometry' (Sonnenschein). If he cares to add more, and in this subject there is eminent wisdom in a multitude of counsellors, the next three should be *The Pitt Press Euclid* (Cambridge Press), Deighton's (Deighton, Bell), and Casey's (Dublin Press).

III. I proceed now to make some unmethodical remarks upon Method:

The Definitions.—It is wrong to treat these as a mere repetition lesson. Have your class round your blackboard, and try to make them up for yourselves. At least half the definitions lend themselves to this. You will have difficulty with the fundamental notions of point, line, and surface—but the difficulty is metaphysical and must be slurred over. Euclid's definition of a straight line: 'that which lies evenly between its extreme points' is bad, a wordy periphrasis which states that all which he can tell us of a straight line is that it is straight. But it is dangerous to tell your pupils that Euclid ever nods, and perhaps you had better leave it. If you wish to emend you may substitute the A.I.G.T. Syllabus definition.

'A straight line is such that any part will, however placed, lie wholly on any other part, if its extremities are made to fall on that part.'

But when once the preliminary terms are mastered, the rest is easy. You put a triangle on the board, and by judicious questions you can elicit the whole definition. The boys will probably all know what to call it.

'Jones, what is that?' 'A triangle, sir.' 'Well, let us find out all we can about this triangle. Is it flat, or is it curved like a ball?' 'Flat, sir.' So you enter on the board—Triangle, flat figure. 'Well, what else?' 'Three corners, sir.' You enter—Triangle, flat figure with three corners. 'Are all flat figures with three corners triangles?' The boy will probably answer 'Yes.' So you draw a triangle with curved sides. 'Is that a triangle?' 'No, sir, they're not straight.' 'What are not straight?' 'The sides, sir.' 'Oh, has a triangle sides as well? How many?' 'Three, sir.' Your board now reads—Triangle, flat figure, three corners, three sides, sides all straight. 'Is this all?' 'Yes, sir.' A little more cross-questioning, and you show him that he has stated more than he need, and reduce your definition to 'A flat figure with three straight sides,' which you have only to translate into Euclid's dialect, and you have done.

The extended non-Euclidian definition of an angle should be introduced from the first, as also should the system of measuring by degrees, so that you may refer to a right angle as an angle of 90°, and give definiteness to your terminology and teaching. You should accustom the pupil early to angles greater than 180°, and to the angle of 180°, for which you will find the phrase flat-angle angle or straight-angle useful. The motion of clock-hands will render you good service here, but, unfortunately, the makers thereof have wickedly contrived that clock-hands shall revolve negatively. A good deal of judicious cross-questioning will be required before the

* La Géométrie qui mesure les corps, peut servir en certains cas à mesurer les esprits même.'

† Smith's 'Dictionary of Greek and Roman Biography,' Article *Euclides*, vol. ii., p. 65. The quotations are from thence.

* This is in many respects the best edition in existence, but the typography is disagreeable, and it seems to me a grave mistake to turn Book ii. into Algebra by the use of *minus* and indices. There can be no doubt that AB^2 had no meaning whatever for Euclid, and has only a wrong and ungeometrical meaning for the average schoolboy.

definitions are mastered. Mackay has five pages of masterly questions full of suggestiveness.* You will be surprised at the answers you obtain to 'Is a rectangle a square?' 'Is a square a rectangle?' 'If I double the arms of an angle do I double the angle?'

You will point out that the Postulates are merely demands for a straight edge and a pair of compasses. If it were not for that bugbear of an examiner I am not sure that I should not advise the almost total omission of the axioms. It is not as if they are complete. They are simply an early attempt to formulate the laws of thought. Euclid assumes several which he does not specifically mention—as, for instance, that the two circles which he draws in his First Proposition will intersect somewhere.† But if you must have axioms you ought not to admit 'Two right angles are equal,' which can be validly proved without the use of any proposition whatever,‡ and which has really been implicitly assumed when you were discussing the question of degrees. Moreover, the so-called 'Twelfth Axiom' must be deferred until after Prop. xvii., unless you would have trouble. A few words at that stage upon this axiom will render the whole theory of parallels as easy as it ever can be in a world where it is unfortunately impossible for us to go to infinity to look after the intersections of our parallels.

Now as to the Propositions. It is my custom to go carefully on the blackboard over the ground of each new proposition with the class. We treat it as a problem, or a puzzle if you will, of which we do not know the solution. We endeavour to find out beforehand how we should do it. It will often happen that a solution different from Euclid's is suggested. We analyse this carefully and point out what reasons Euclid may have had for preferring his own. For, of course, we assume that Euclid was fully aware of ours, since in dealing with young pupils it is bad to doubt the omniscience of your author. Then we send the class to their seats. We ask them to go over the proposition in their books. We draw the figure for them, topsy-turvy, and with different letters. We insist on their applying Euclid's reasoning to our figures. On no account whatever must they be allowed to learn any portion of their work by heart, not even, at first at all events, the Enunciations. Our aim is Mental Discipline, not Mnemonics. Then, *in the next Euclid Period*, and never on the same day or in the same lesson, their knowledge is tested. Again we draw the figure for them, in some other state of topsy-turveydom, with some other letters, and we ask them to write the proposition out and mark their work accordingly. Here I may note that it is a good plan to draw that portion of the figure which is among the *data* in thicker lines, or with coloured chalk, reserving thin lines, or some different colour, for those portions which are given by the *construction*. It seems to me essential that this should be done in the Text Book adopted for Class use, as it is in most of the editions named here. But in asking for the proposition we endeavour to depolarise it, if I may borrow a striking phrase from Wendell Holmes. We do not ask for an equilateral triangle, we ask for a triangle with three equal sides, or for a triangle each side of which shall be 1 inch long; we do not ask them to describe a parallelogram equal to a given figure, and having an angle equal to a given angle, we ask for a rectangle equal to the given figure, and so forth.

The proposition known, the first step is taken, but only the first. The notion that the First Book of Euclid is known if we know some 48 propositions is one which has done immense harm to mathematical teaching. Remember that in this subject we are teachers of *method*, not results. I say that the proposition is *not* known as it ought to be, unless its principles can be applied to the solution of little problems upon it, and I add that it is my firm belief, the result of experience, that the dullest may be taught to solve these. Herein lies the supreme merit of Mackay's book for the teacher's use, for to every proposition this editor adds from 9 to 10 easy Riders or problems. These are often such as the teacher may readily make for himself, and the teacher ought, indeed, to keep a collection of such home-made problems. I will take a few instances.

After Proposition i. we should ask as follows:—*

(1.) Draw an equilateral triangle whose sides are each 1 inch long.

A word here on behalf of so-called Geometrical Drawing. I believe that it adds definiteness to the ideas without any loss of logical power, and that its almost universal neglect by teachers of Euclid has been a great loss of power to them.

(2.) Show how to find a point equidistant from two given points.

This widens the conception of the meaning of the proposition.

(3.) How many equilateral triangles can be described on the given line? Draw them all.

The pupil must never be allowed to miss the fact when his problem has two solutions.

(4.) Draw a straight line which is twice as long as a given line.

(5.) Given a straight line 1 inch long, show how to draw a straight line 3 inches long. How many ways are there of doing this?

If the principles involved in these last two problems are not fully grasped you will extend them and ask for straight lines 4, 5, 6 inches, &c., as the case may require.

(6.) Construct an isosceles triangle whose sides are 1, 2, 2 inches respectively; 1, 3, 3, &c.

Be careful here that you do not allow the transference of length by simple movement of the compass, for if you do you will destroy the Second Proposition, which is of supreme mental benefit.

(7.) If both points of intersection be joined with both centres the figure is a rhombus.

(8.) Construct a rhombus having one of its diagonals equal to a given line.

(9.) Keeping (6) before you, show that there is an infinite number of solutions to this question, as also to (2).

* 'The Progressive Euclid,' by A. T. Richardson (Macmillan and Co.), will also be found useful in this connection.

† On this whole topic of Axioms and Postulates, see the Pitt Press Euclid.

‡ See the A.I.G.T. Euclid. p. 20 (*a*). The book which is thus referred to in Sonnenschein's edition, previously mentioned.

* I here borrow freely from Mackay, and from the Pitt Press Euclid.

(10.) Show how to make a rhombus having each of its sides equal to a given straight line.

(11.) Given a line, length one inch, construct a triangle whose sides are 3, 4, 5 inches respectively.

You thus solve i. 22 for the case when the sides are commensurate. But you must on no account at this stage point out that the angle of this triangle is right, for otherwise your pupils will assume an angle right when it looks to be.

(12.) Lastly, if you ask them to draw a triangle whose sides are 1, 3, and 5 inches, and if you point out that the problem is impossible, and why, you pave the way for Euclid i. 20, and you will do yourself service in another direction, for most of your pupils will not see that the problem is impossible until they draw their circles, and you can remind them of this when they tell you, as they probably will when you come to i. 20, that the theorem is obvious, and no proof necessary.

(To be continued.)

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RECREATIVE BOTANICAL PAPERS.

BY PROFESSOR GREEN, M.A.

I. Leafy July.

No time in the year offers a richer harvest of floral treasures to the botanist and lover of flowers than the leafy month of July. All I can hope to do, in the short limits of this paper, is to show from a handful of field and hedgerow flowers, with which you can easily supply yourselves, the marked *traits* or characters of some of the classes into which flowering plants are now divided by botanists. A very common classification, with which you are familiar, is the three-fold one of *trees, shrubs, and herbs;* but when you learn that some families of plants which are shrubs or herbs with us have in the hot climate of the tropics only trees in their number, you will see that this is not a satisfactory classification. At first sight you might think it a good plan to arrange all the plants known to us according to their uses. A Greek philosopher, who thought so, made four divisions: plants good for food; plants good for smell; plants good for making wine, and plants good for medicine. You can see at once, however, that all plants cannot be placed under these four heads, and that some plants might be placed in more than one of these classes. The *bean*, for instance, is a very valuable food for cattle, and few scents are sweeter than that of a bean field in full bloom. The classification that is most used now is called the *natural system*, because it aims at grouping plants together according to their real relationships. From our fields and hedgerows we can easily supply ourselves with examples of its leading divisions.

Everywhere the meadows are now bright with buttercups—let us pull up a handful. Perhaps we may be lucky enough to find floating on the thick water the pretty white flowers of the water-crowfoot. With a small trowel, or a good strong pocket-knife, we will carefully dig up our plants so as to preserve the roots, nor will we be content with a single specimen of each. We will try to get one buttercup which is still in the bud, another with fully open flowers, and a third whose flower has given place to the fruit, and so on with the others in our list. A botanist generally carries what looks like a large sandwich tin—this is specially made for holding plants, and is called a vasculum. We have no vasculum, but if we have been thoughtful enough to bring a tin box with us, say an old biscuit tin, we shall find that our specimens will be kept almost as fresh as when we gathered them, instead of being withered by the hot sun. We shall find the benefit of this when we come to take them to pieces in order to examine them. If we have to carry our flowers in our hot hands, and they get withered, we must put them in water to revive them before we look at them.

But we have not yet finished gathering our plants. From the hedgerow of the lane that runs down to the river I want you to pick some pieces of the wild clematis or old man's beard (traveller's joy is another name for it) and a few branches of the dog rose. We may add some sprays of the blackberry to our list, for I hope you will not be content to examine the flowers we are going to look at together just once, but will study them and re study them. This yellow-flowered plant, of which there is such a lot by the hedge, looks very much like a buttercup, you think. We will take some plants of it—*potentilla*, as it is called—with us, however that may be.

We are by the river now, and can see the sword-shaped leaves and handsome flowers of the yellow iris, in search of which we have come; nor must we go away without some of the blue forget-me-not that is growing by the edge of the water.

We are all a little tired now with our ramble, and with stooping over the flowers we have been digging up. I can quite fancy some of you are saying to yourselves, 'We might just as well have gathered some flowers out of our garden to pick to pieces.' Well, it is better generally to examine wild flowers than cultivated ones. If you take one of the pink cabbage roses that are now in blossom and compare it with the wild rose we gathered from the hedge, you will see the latter is much the simpler of the two; but you may gather from the garden some raspberry and strawberry blossom, some pansies, lilies, monk's-hood, columbine, larkspur, globe flower, blue flag, and a peony or two.

Now we have got all our plants spread out in front of us, and we want to separate them into groups which shall be made up of those most like each other. First look at their *leaves*. You will see that they vary much in shape and size, but if we try to arrange them by these differences we shall get into a worse confusion than did the philosopher I told you about. Just hold one of your buttercup leaves up to the light. What a lot of lines it has running through it! Quite a network of them! If you were to make a skeleton of the leaf by soaking away all its green pulp you would see its framework, or *venation*, even more clearly. Look now at all your other leaves. Do you see any leaf whose lines do not form a network? The lines surely in this great iris leaf run parallel to one another all along the length of the leaf from bottom to top. Is any other leaf you have like this? The blue flag, I hear some one say. Yes, and the lily. That is so. We have divided our plants into two heaps, corresponding to two classes:—plants that have net-veined or reticulated leaves, and plants whose leaves are parallel-veined.

We will now take our yellow iris and *dissect*, or pull it to pieces, carefully Those of us who have got a sharp knife

and a long thin darning needle will be able to do this more carefully than those who use only their fingers. In this flower, notice the number of the parts we take carefully off. We have six covering leaves, three dust spikes or *stamens*, and in the middle of the flower an *ovary* (so called because it contains the egg-like seeds) which has on its upper part one column or *style*, from which branch three leaf-like *stigmas*. Now take the buttercup. We have five green covering leaves or *sepals;* inside them are five yellow leaves or *petals;* then come more stamens than we can easily count, and in the centre of the flower a large number of small green bodies, which are ovaries or seed holders. You will see then, that while in the iris the parts of the flower are arranged in threes, in the buttercup they are arranged in fives. Now you remember that the iris has parallel-veined leaves, while the buttercup has net-veined leaves. Looking through our large heap we find that all the plants we have gathered with net-veined leaves have the parts of their flowers arranged in fives. Now compare the garden flag, the lily, and the wild iris. They all have parallel-veined leaves, and as we should expect, the parts of their flowers are in each case arranged in threes.

Now I am going to show you a bean which has begun to grow. The shoot you see that is throwing out a few white fibres is the root-bearing part of the plant, and the other shoot bears what are evidently leaves. But what are the two flat lobes which grow thinner in proportion as the shoots grow longer? They are the *seed leaves*, or *cotyledons*, from which the infant plant is fed.

This Indian corn I had boiled half an hour. You will see an oblong white marking on one side of it, and if you cut the skin carefully you can get out a thick triangular body which consists of one *seed leaf* or *cotyledon*, which is wrapped round the infant plant. Some plants you see have two cotyledons, and others only one, and from this difference result two great classes into which all flowering plants may be divided, *dicotyledons*, with two seed leaves, and *monocotyledons*, with one. Into which class now are we to place the plants we have gathered? Their seeds are so minute that we cannot see the future plant in them. We will look at the leaves and flowers of the bean. The former are net-veined, and each of the latter has five outer covering leaves, five inner ones, two of which are joined together over the stamens; ten stamens, one loose, and nine gathered into a bundle, and an ovary, style, and stigma. We have no Indian corn flower to look at; but we can see the wheat, which is a near relative. The leaf is parallel-veined, and the flower, which does not look much like a flower, still shows three stamens. Now the plants in our large pile are net-veined, and have the parts of their flowers in fives, like the bean, while the iris, flag, and tulip have parallel-veined leaves, like wheat, and the parts of the flower are in threes. We expect the former to have two seed leaves, and be therefore *dicotyledons*, and the latter to have only one seed-leaf, and be therefore *monocotyledons*. Botanists, with the aid of a microscope, have proved this to be so. We have collected specimens of two great classes of plants then—dicotyledons and monocotyledons.

Dicotyledons, as we should expect from the variety in our two heaps, form a larger class of plants than monocotyledons, and we will now try to divide them into smaller groups. We will take several flowers carefully to pieces, and this time we will think only of the places from which the stamens of the flowers spring, and whether the inner covering leaves, or *petals*, can be picked off separately or not. You will see that in the buttercup, crowfoot, clematis, monk's hood, columbine, larkspur, globe flower, and pansy, each petal can be detached without interfering with the others, and the stamens, like the other parts of the flower, are inserted on the swollen top of the flower stalk. This protuberance is called the *thalamus*, and all dicotyledons with free petals and stamens inserted on the thalamus are called *thalamiflorœ*. In the bean, potentilla, dog rose, strawberry blossom, raspberry blossom, blackberry, the petals are free, and the stamens appear to be inserted on the outer covering leaves, or *calyx*. These plants are therefore placed in the division of dicotyledons called *calyciflorœ*.

The forget-me-not which we picked at the edge of the stream seems at first sight to have no stamens, but we notice that the petals cannot be picked off separately. The whole ring comes away in one piece, and is seen to have a very short transparent tube, on the top of which is a flattened wheel-shaped rim. If we split up this tube the stamens will be found to be attached to its interior, and their tips are just visible in the centre of the wheel before we cut it. The forget-me-not is accordingly placed with other flowers whose stamens grow apparently out of the petals or *corolla*, in a division of dicotyledons called *corolliflorœ*.

Our large heap of dicotyledons is now divided into three piles: in one we have thalamiflorals, in another calyciflorals, and in the third corolliflorals. Potentilla, which looked like a buttercup, does not belong even to the same division. The buttercup, we have seen, is a thalamifloral plant, while potentilla must be placed under calyciflorœ.

There is still another variation in the flower we have not yet met with. Run into the garden and look at the rhubarb bed. The plants will by this time have put up a long shoot in the middle of the leaves whose stalks we used in the spring to think so palatable. This shoot will be covered with large numbers of small flowers. Take some of them in and dissect them as you did the others. They are just like the other dicotyledons, except that they have no petals—only sepals being round the stamens and ovary. On this account they are part of a fourth division known as *monochlamideœ*, or flowers with only one kind of covering leaf.

Next month we will look a little more deeply into some features of these flowers, and see what are some of the closer relationships that exist in these groups.

In the mean time we have learned that all flowering plants are divided into two great classes—*dicotyledons*, plants with two seed leaves, net-veined leaves, and the parts of the flower in fives; and *monocotyledons*, plants with only one seed leaf, parallel-veined leaves, and the parts of the flower in threes. Dicotyledons are subdivided into *thalamiflorœ*, with free petals and stamens inserted on the thalamus; *calyciflorœ*, with free petals and stamens apparently inserted on the calyx; *corolliflorœ*, with united petals and stamens apparently growing out of the corolla; and *monochlamideœ*, which have no petals at all.

(To be continued.)

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TEACHERS' NOTES OF DRAWING LESSONS FOR STANDARD III.

By E. BUFFERY-RIDGE, *Art Teacher under the London School Board.*

Freehand.—Standard III.

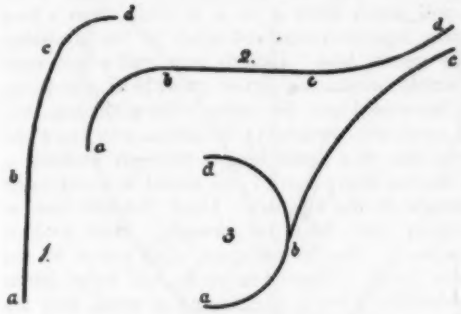

Fig. 1.

1. This is a continuous line made up of three parts. Let it be supposed to represent a road—a man walking from *a* to *b* would keep straight on, from *b* to *c* he would be bending slightly to the right hand, and from *c* to *d* he would still bend to the right, but more quickly. There are no corners or gaps or rough places in the road to hinder or stop him. The first part *ab* is a straight line, the second part *bc* a piece of a large circle, and the third part *cd* a part of a small circle.

2. *ab* is part of a small circle turning to the right, *bc* is straight, *cd* is part of a large circle bending to the left.

3. From *a* to *d* the curve bends steadily to the left, but to get to *c* the left hand turn must be changed into the right hand at *b*. The small circle that makes *ad* and the large circle forming *bc* do not cut across each other, but only just touch.

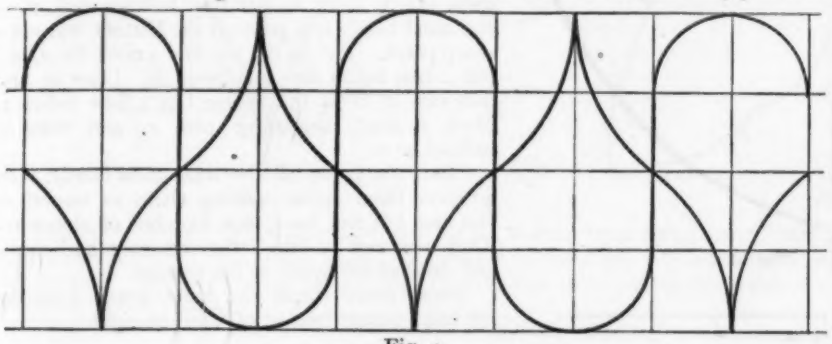

Fig. 2.

This copy is made up of circular curves and straight lines running into each other so that they would join into one without forming corners or ugly bends in the middle of the lines. Should be drawn on black-board and copied step by step, completing one series from end to end before beginning the other.

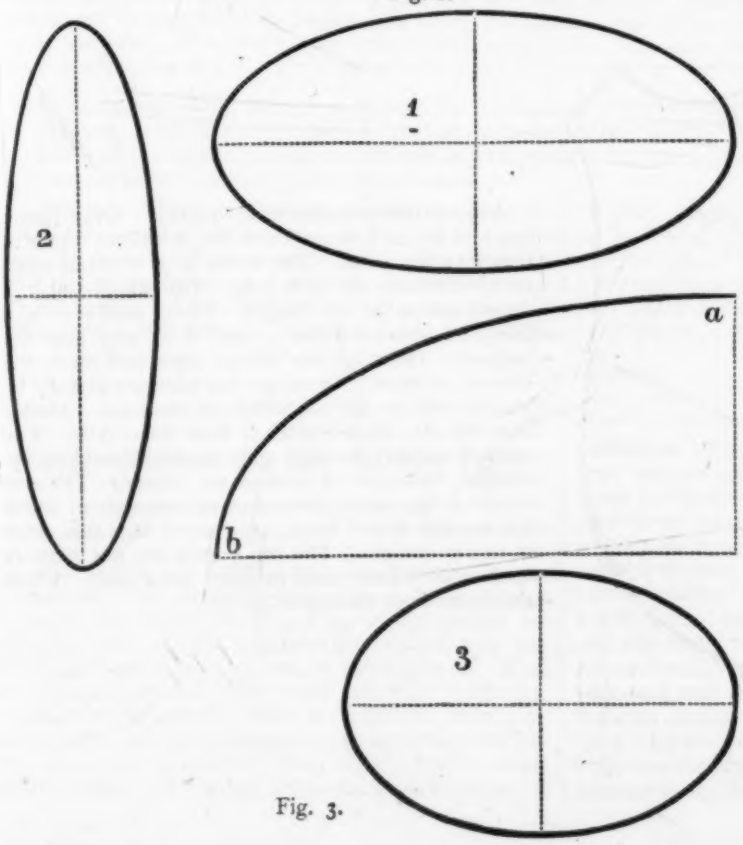

Fig. 3.

No. 1 is an ellipse. It is not made of any bits of circles nor of any bits of straight line. Its ends are nearly round, and its sides nearly straight, and they change gradually into each other.

ab is a quarter of the ellipse drawn larger. Starting from *a* the line bends gradually more and more till it gets to *b*. All four quarters are exactly alike. No. 2 is a longer ellipse, No. 3 a rounder one.

In No. 1 the length is twice the width, in No. 2 four times, in No. 3 one and a half times. The last is the hardest to draw, but take care *not* to make the ends of No. 2 *pointed*. The shape of an egg is not an ellipse, because one end is bigger and rounder than the other.

(Lines that are dotted in the copies are to be drawn very lightly, not dotted, and afterwards rubbed out.)

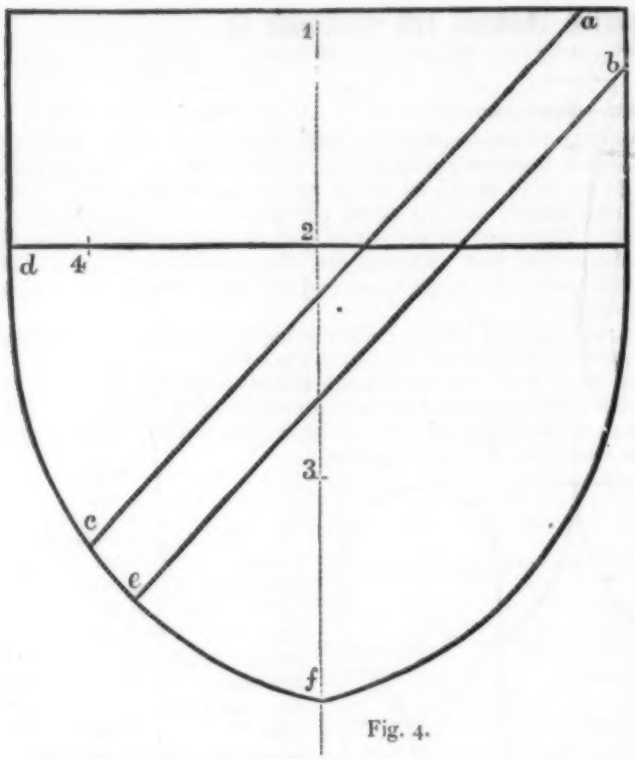

Fig. 4.

In copying the shield, the proportion of the parts is the most important point. Divide the centre line into three equal parts, and compare the width of one side with one of the parts. It is greater than one and less than two parts. One part will reach from 2 to 4, so that from 2 to *d* is rather less than one and a-half of the divisions of the centre line. Exactly one and a-half each side would make the figure as wide as it is long; but that would not be right. Draw the top line, mark each side nearly 1½ divisions, and draw the second line the same length through number 2, because the lower part of the shield is about twice the height of the top part. Draw the side lines of the upper part; *they are straight.* Next look at the sides of the bottom part, they curve to the bottom point. These curves do not bulge out at the sides like a boy's cheeks full of wind, they are nowhere wider than the part above them. Draw them exactly alike, so that they balance each other and meet nicely in a point at the bottom, but not a sharp point. Put on the top line a mark for *a*, and put *c* just below the middle of *df*. Draw *ac*, and take care to cross the centre line a little below 2. Mark *b* after comparing with *a*, and draw *be* parallel to *ac*.

Clean the paper till the lines show faintly, then go over them again, making them as smooth as you can, but not hard, nor like bits of thin wire. They need not be thin if they are even and clean, and finished off neatly at the corners.

Second time.—Draw the band across from the left hand corner instead of from the right.

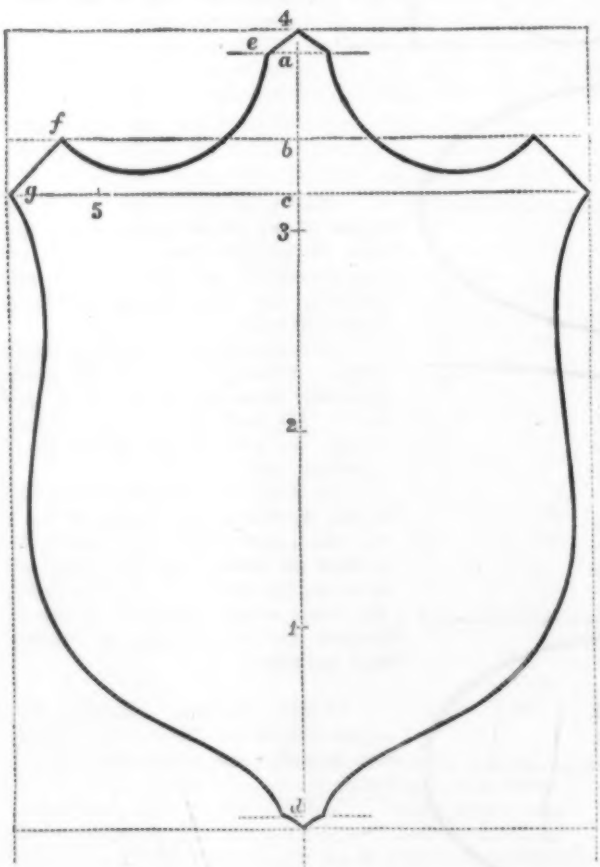

Fig. 5.

Another shield, rather more difficult. Draw centre line and divide it to get the width as before; but this time into four parts. The width at *g* is about equal to 1½ divisions on each side. The whole width is three-quarters of the length. Place marks at *a*, *b* and *c*, all above number 3, and at *d*, very near the bottom. Draw all the dotted lines and mark the corners on them. Don't get too wide at *e* and *d*; be sure to look at *half* the width on the copy. Mark *f* from the side lines instead of from the middle. The short lines on the top and on the shoulders are straight, those at the bottom are curved. The side curves bulge out a little, but not enough to touch the straight dotted lines. A piece of each side curve is nearly straight. The top curves are not parts of circles; they bend most in their lower parts. Clean and finish as in the last copy.

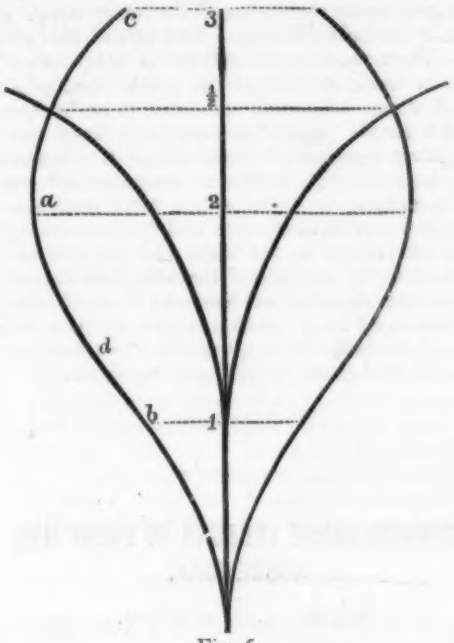

Fig. 6.

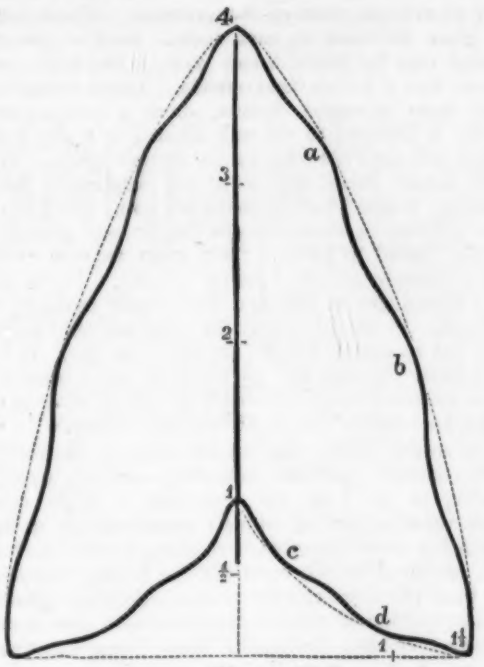

Fig. 7.

Figure 6. Draw the middle line and divide it into three equal parts, then the dotted lines across, a little longer than you think they ought to be. Look at *a* in the copy. Is *a* 2 longer or shorter than from 2 to 3? A little shorter. Mark *a*, and the same length on the other side. Mark the width at *c* about half of the width at *a*, and *b* a little less than *c*.

Draw next the long curved line on the left-hand side. Starting at *c* the line curves in one direction to *d*, being widest at *a*. At *d* it bends in the other direction and runs into the middle line at the bottom. Now start at the bottom, and in fancy walk up the line you have just drawn. You will be bending to the left till you get to *d*, after that to the right. At *a* you will be farthest from the middle. Take care that the roundness and smoothness of the line is all right at *a* and *d*. Let there be no corners to be seen in it.

Draw the right hand side, copying from the left, and make the two exactly balance each other.

Half-way between 2 and 3 draw a thin line across as a guide for the inside curves starting at 1.

Make all the curves join the middle line as if they would run along it, not cross over it. Remember how tram lines join each other when two lines run into one.

Figure 7. This easy-looking copy wants a great deal of care. Draw the middle line, divide it into four, and consider the width at the bottom. Each half of the bottom line is about $1\frac{1}{2}$ of the divisions of the middle line. Draw the other dotted lines lightly, notice that the wavy line of the side of the leaf touches the dotted line twice, at *a* and *b*. Mark the places of *a* and *b*. From the top to *a* is shorter than from *a* to *b*, and *a* to *b* shorter than from *b* to the bottom. Draw first one side, then the other. Mark *c* and *d* on both sides, and draw the lines. Make the *four* corners a little rounded, not sharp—(top corner, two at the bottom, and one in the middle).

(To be continued.)

SCHOOL MUSEUMS AND HOW TO FORM THEM.

BY RICHARD BALCHIN.

'STUDIES serve for delight and for ornament,' some one has said. So do school museums; and for use also. At least, they should do so. They should delight the children; they should ornament the schoolroom, and they should certainly be of use to the educator. What *is* a school museum? The word 'museum' (Greek): 'a place for the muses.' Nine unfortunates! who have had hitherto but small place in our elementary schools. 'A cabinet of curiosities.' Yes, truly. And in some schools there are some remarkable collections of curiosities. But they neither delight nor ornament; and they appear to be of no use to anybody—mere rag, bone and bottle shops. A school museum must, first of all, be of some use. To be of some use, it must contain specimens of all the available objects which the teacher is going to talk about; so that the teaching shall be of concrete things and not of abstractions. The children must be able to say, 'I have seen and handled, and therefore I know.' And for science teaching the museum should also contain the apparatus, and all the odds and ends which the true teacher continually needs. Now for details. There must be a collection of things in each room of the school. I find that it is of very little use to have an elaborately arranged case of specimens in the hall or the master's private room, or

indeed in any *one* room of the premises. There must be a glass wall-case in each room. Such a case or cupboard may be about 8 feet wide, 3 feet high, and not more than 6 inches deep outside. There should be a good many moveable shelves, about 4 inches apart. The case is fastened to the wall about 4 or 5 feet from the floor, and does not take up any ground space. The London School Board did not at one time supply these cupboards; hence I had to make my own, which when certain progressive members saw they at once prevailed upon the Board to adopt. Such cases are now to be found in nearly all the London schools. There are several advantages in having a little useful museum in each room. In the first place, the class teacher has his objects and apparatus handy; he keeps the key. If he had to leave his class and go to some other room for what he wanted he would probably try and do without it, and give his 'object' lesson without the 'object.'

In the second place, the teacher takes an interest in what he considers his own collection, and feels a pride in adding to it. I do not remember a single mid-summer vacation closing without some member of the staff bringing fresh specimens—specimens which he has himself procured in the course of his holiday rambles. In the third place, the children themselves take a greater interest in a group of objects placed in their own room, and which they have continually before them, than they would in, it may be, a much more pretentious collection elsewhere, and which they seldom get a chance of seeing. I know very well there are drawbacks to this plan of separate cases. There is, first, the question of expense. That is, however, easily got over. If the managers will not or cannot afford to supply them, let the master make them himself. A little carpentering will do him good. There is in the second place the question of appearance. It is perfectly true that one large glass cupboard, with all the varied objects artistically arranged, tier above tier receding, like the Crystal Palace orchestra, is a pleasing feature, and a thing of beauty, especially when nobody dreams of ever taking anything out of its place, and so spoiling the picture. One morning during last year's inspection I found Mr. Duport examining the little collection in Mr. Gautrey's second-standard room.

'I am afraid you do not think that case presents a very artistic appearance,' I remarked.

'Well,' said the inspector, 'it presents the appearance of having been very well *used*, and that's something.'

Still there is no reason why these separate cases should look untidy. The glass doors should always be kept clean. The apparatus should not be returned to the cupboard dirty, and what specimens there are should be neatly arranged; for it must be remembered that the whole thing is continually before the eyes of the boys, always under their contemplation, and the growing faculty of a 'correct taste' is largely influenced by what the eye most frequently dwells upon. It is for these reasons that the School Board for London has so wisely determined that the walls of their schools shall be decorated with beautiful pictures, and, indeed, real works of art. Looking round upon these things, and upon the cheerful well-lighted rooms, Mr. Lyulph Stanley, on an occasion of a visit to my school, remarked to a friend whom he had brought with him, 'This place is itself truly educative.' Hence, although I would never dream of sacrificing practical utility to a pleasing appearance, yet the latter is a feature of considerable value. The chief objection to be urged against the plan of separate cupboards for each room is, that it necessitates a great many specimens of the same thing. This, in fact, is the only difficulty I find attend the arrangement. There must be several sets of specimens of raw cotton, of wool, of flax, of the metal ores, of various kinds of stone, &c. Also each case must be furnished with the simple apparatus used in science teaching. The getting together all these things is a question of time. Anybody who wishes to start a school museum must be content to begin with a mere nucleus. The collection will grow as scholars and teachers are induced to take an interest in the work. In my next article I will describe the contents of the ten glass cases which constitute the 'museum' at 'Nunhead Passage'; also how I have managed to get such a large collection, numbering over a thousand objects, together; and how they are distributed throughout the different standards.

(To be continued.)

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COMMON-SENSE LESSONS IN EVERY DAY HOUSEWORK.

BY MRS. E. A. SHARMAN.

(*Lecturer to the National Health Society.*)

Introduction.

Some effort must be made to restore household work to its old place of honour and dignity. In order to accomplish this end, housework should be taught in schools both elementary and technical. With regard to the teaching in elementary schools, much of the apparatus necessary for instruction is ready to hand in the cookery kitchens. In technical schools, one room could be so fitted that it might be used for the teaching of cookery, laundry-work, and housework. If upper and middle-class girls could be induced to learn every detail concerning the keeping up of a house, those beneath them in social rank would quickly follow their example—as, for instance, in cookery and sick-nursing. It is difficult in towns for girls and young women to acquire a knowledge of housekeeping, owing to the great change in home circumstances brought about by mothers and daughters taking up work outside the home. It is, however, a most important part of every girl's education that she should be taught the domestic arts.

Practical work is only to be learned through teaching and experience. There has been so much improvement lately in the art of modern living, that domestic economy may now be regarded as a science, the art of which can only be acquired by patient study, forethought, and practice. The thousand and one details of the housekeeping of to-day is a great tax on many women's endurance and steady plodding for the sake of others. It is very difficult to become proficient in household management, simply from the want of elementary teaching in details, which is given as a matter of course in other studies, but which is supposed to come to all girls by nature. These lessons will be so arranged that they can be used as a complete manual of study for any girl wishful to train herself in the art of housework.

Nearly every small house contains a scullery which leads from the kitchen. The kitchen and scullery combined may be considered a girl's workshop. A small-sized scullery is fitted with sink, plate-rack, cold water fittings, washing copper, meat-safe, and a few shelves. A larger scullery is fitted likewise with the addition of tables, cupboards, and *hot* water fittings. If a girl learns the management of a small scullery, she will have no difficulty in managing a larger one if called upon to do so. The kitchen and scullery being a workshop they contain many things, and a great variety of work is done in them which ought to be conducted orderly and with method. In small houses the family meals are nearly always taken in the kitchen. It is most important that there should be 'a place for everything, and everything in its place,' or there will be little comfort for any one when using the kitchen as a living room.

Elder girls can be of great help to their mothers by learning how to manage the home. If a girl would be a housekeeper she must first learn to be thoughtful. There are so many branches and details of domestic art, that if forethought is not used in arranging the order and method of housework everything will be in a continual muddle.

The Scullery.

Before beginning to learn scullery work, which is the roughest and dirtiest part of housework, a girl should be provided with a pair of gloves, so that her hands may not become rough and discoloured, and a dark coarse woollen apron. She must also have a square of coarse canvas for placing in front of the hearth when polishing grates, and for kneeling upon when doing general work.

When commencing to clean a kitchen range, or any other range, the hearthrug must be rolled up and put on one side to be shaken with other rugs. The canvas must then be laid in place of the hearthrug, and the apron and gloves put on. Place all necessary cleaning materials upon the canvas. This is the first exercise in forethought, and it should be explained to the girl by the teacher how much time is saved by first placing the materials and tools required for the work to be done close at hand in the beginning. How much more cleanly the habit of putting on a large working apron, and spreading on the floor the piece of canvas kept for the purpose! Begin work by raking out the ashes gently, so as not to cause a dust; use a piece of stick to do this, as being less noisy than the poker; sift the cinders into a scuttle for use and throw the dust into the dustbin. Take a small hand brush and sweep down all the soot from flues and oven, and, lastly, put the brush up the chimney, if an open range, as far as can be reached, and gently sweep the soot down from the mouth of the chimney, to prevent it from falling upon saucepans when on the fire, and to make a better draught up the chimney. Mix some powdered blacklead in a gallipot with sufficient cold water or turpentine (the latter keeps a grate from rusting) to make it into a smooth thick paste. Dip a small round brush into the mixture and smear the bars of the range all over, brush it quickly with a soft brush before it becomes dry, then polish with a harder brush. After the bars are done, polish all the range in the same manner, beginning from the top of the stove and moving downwards. If a little powdered *dry* blacklead is brushed over the stove last a higher polish can be got. Rub the steel handles and bolts of the oven with emery paper. Brass handles and bolts should be polished with powdered brick dust mixed with turpentine, using dry brick dust and a leather for finishing. Sweep up the remaining soot and dust, and the stove is then ready to lay the fire, and clean the hearth.

To clean a Gas Stove.—The same materials will be required as for polishing a kitchen range. Lift out the bars at the top, wash them and the top of the stove with a flannel dipped in hot water and soda, so as to remove all grease and dirt; then wring out the flannel, and partially dry with it. Proceed to blacklead and polish the stove in the same manner as a kitchen range, being careful not to stop up the gas holes with the blacklead. Place the bars back over the stove, polish the brass handles of the gas-burners with brickdust and a leather. If a tile or zinc skirting runs round the top of the stove, wash it with the hot soda water, and dry with a cloth.

To clean Mineral Oil Stoves.—Trim the wicks, take a piece of old flannel with a little dry whiting, rub the brass and tin work until all stains are removed. Polish with a leather.

Spirit Lamps can be cleaned by using paraffin applied with flannel to the surface, using a little brickdust if very much stained. After rubbing well, polish with a soft cloth and a leather.

Lamps used for artificial lighting must be kept perfectly clean in every part, or the air cannot circulate freely, and the lamp will not burn well. The wick should touch the bottom of a lamp, and be trimmed square across. Clean the brass of the lamp in the same manner as for spirit lamps. Do not fill the lamp with oil to the top; heat expands the oil, which forces its way out of the lamp, making it both dirty and dangerous. Never burn a lamp when the oil is very low, as a gas collects in the lamp, which is liable to explode. Be sure the wick is turned up high enough to burn freely; if not, the room will soon be poisoned with the gas from it. Fresh air is necessary for a bright light. It is dangerous to carry a lamp about. The cold air striking on the hot chimney-glass, will break it as quickly as heating too rapidly. Lamps should always be filled with oil and wicks trimmed before dark.

To clean Iron, Tin, and Enamelled Ware.—Iron saucepans without tinning inside, if scoured with silver sand, and washed with hot soda water, and well dried before putting away, will look better every year, because they become quite polished.

Tinned saucepans must be used with great care. No food should ever be allowed to stand and get cold in them, as the tinning often contains lead, which is poisonous; again, if one of these pans is put on the fire, only half full, the tin will melt and run down the sides, and settle in lumps at the bottom, the difficulty of cleaning the pan being increased from the roughness on the sides and bottom. If very coarse sand is used it scratches the tin off in places, then the pan soon begins to rust. Sapolio is a good cleansing soap. Damp a piece of flannel, and rub it on the cake of Sapolio, then rub the inside of the saucepan until clean, wash out with hot soda water, and dry with a cloth. Always wash the outside of iron and tin saucepans as well as the inside, doing the lid also. If saucepans are very dirty, boil some time with a strong solution of common soda and water, then brush well with a saucepan brush made of twigs.

Tin saucepans are cleaned with whiting moistened with a little water, rubbed on the article with a piece of flannel, and when dry polished with a soft cloth, or use Sapolio as directed for tinned iron saucepans.

Enamelled ware, which look as if they were lined with white china, often contain substances which, like lead, poison anything that is allowed to grow cold in them. If the articles are stained, rubbing with silver sand or salt until clean, then washing with hot water, is all that is needed. Care must be taken to allow nothing to burn upon enamelled ware; burning chips the enamel.

To clean a Copper or Brass Saucepan.—Mix sand and salt together in equal portions, wash the saucepan well in hot water and soda. Soap a piece of old flannel, dip it into the sand and salt, rub the inside of the pan until all stains are removed and it has become clean and bright. Wash and dry it quickly, turn the pan over and clean the outside by soaping an old lemon rind, dipping it in the salt and sand, and rubbing until all stains are removed. Vinegar could be used instead of the lemon rind. Rinse the saucepan thoroughly in hot water, dry it quickly with a cloth, and polish the outside with a leather.

Steel saucepans must be scoured with silver sand and salt, after washing all grease and dirt off with hot water and soda. Use a piece of old flannel for the purpose, wet it, then soap it and dip it in the mixture, and rub briskly until all stains are removed from the inside and outside of the saucepan; rinse in hot water, and dry with a cloth.

(To be continued.)

SCHOOL MANAGEMENT, AND PEDAGOGIC TRAINING.

BY DR. GEORGE BEACH, M.A.,

Co-Author of 'A Manual of Our Mother Tongue,' Author of 'Elements of English,' 'Entertaining Readers.'

CHAPTER I.

What is Education?

1. 'Whatever helps to shape the human being; to make the human being what he is, or hinder him from being what he is not is part of his education.'—*John Stuart Mill.*

2. 'Education aims *first* to cultivate all the various principles of our nature, both speculative and active, in such a manner as to bring them to the greatest perfection of which they are susceptible; *second*, by watching over the impressions and associations which the mind receives in early life to secure it against the influence of prevailing errors, and so far as possible to engage its prepossessions on the side of truth.'—*Dugald Stewart.*

3. (*a*) 'The proper business of education is to develop the man, to keep in view all his faculties, to aim at their culture and perfection, not singly and apart from each other, but as a whole, and by a simultaneous though gradual progress.'

(*b*) 'The general development and elevation of the powers of the human mind to a pure human wisdom is the universal purpose of education, even of the lowest man. The practice, application, and use of these powers and this wisdom, under special circumstances and conditions of humanity, is education for a professional and social condition.'—*Pestalozzi.*

4. 'True education is to study the nascent powers of a child, and so to frame their surroundings and aid their unfolding according to organic laws, that the active use of each and all in harmonious work becomes both a pleasure and a necessity, and the child's whole nature is drawn out to form the perfect man.'—*Fröbel.*

5. 'The function which education has to discharge is to prepare us for complete living.'—*Herbert Spencer.*

6. 'Education seeks by social stimulus, guidance, and control to develop the natural powers of the child, so as to render him able and disposed to lead a healthy, happy, and morally worthy life.'—*Sully.*

Divergence of Opinion regarding Education.

From the foregoing definitions of education by prominent thinkers and educationists, it is plainly evident that no single one of them agrees in every detail with any other. Nor indeed is such agreement to be expected, neither is it scarcely possible, until the views of psychologists as to the constitution of the human mind become more coincident, and the aims of educationists less diverse. Here we have the nature of the plastic object which is to be moulded, and the ultimate form which it should assume, disputed about. How then can the nature of the operation to be employed, the methods to be adopted, and the tools to be used be agreed upon?

The definitions differ as to—

(1) the agencies at work, some recognising only the deliberate intention of man:

(2) whether restraining influences, which appear to produce but a negative result should be included: and

(3) the extent of the area within the human being which education can occupy.

Some Compensatory Considerations.

Nevertheless, fortunately for our object, there are several considerations which materially assist to remove these initial and formidable difficulties, as far as the teacher in Government schools is concerned.

(1) There is a much greater practical than theoretical consensus of opinion.

(2) Many of the branches of education, such as corporeal and religious, are removed by the State from his sphere of operations.

(3) The teacher's responsibilities for the methods adopted and the results achieved are diminished in the same proportion as his freedom of action and area of influence are restricted by the exigencies of a national (and therefore comparatively non-elastic) system of education.

Both Sides of the Question.

What the Government teacher in elementary schools is required to do, when he shall do it, and how he shall do it, are in great measure prescribed for him by positive enactment, by professional training, by public opinion, and by limited opportunities.

There is, however, another side to the question. All these curtailing influences, viewed from another aspect (whilst they do certainly render it more easy in many cases to secure *official* approbation), immeasurably increase the difficulty of the truly scientific and artistic teacher. They seem imperatively to demand from him greater native capacity, greater professional skill, higher human love, deeper thought and research, more burning zeal and more strenuous industry, in order to compensate for manifold and multifarious disadvantages.

The 'Via Media.'

Whilst therefore not neglecting the more commonplace and official views of Education—whilst we shall even remember that most teachers must be not only benefactors of their species, but of themselves—the highest aims and greatest extent of child training, and the subtler knowledge needed to counterbalance disadvantages will not be forgotten. Our aim will therefore be, on the one hand not to indulge too much in metaphysical speculation and transcendental aims, and on the other hand not to descend too low among mere mechanical methods and ordinary routine. Let there be so much of science as will aid art, so much of art as will robustly develop and refine, and so much of development and refinement as shall benefit society and advance the individual in the scale of being.

CHAPTER II.

The Different Branches of Education.

The number and character of these obviously depend upon the constitution and kind of thing to be educated, and upon what should be the purposes of that education. In other words, we must analyse the human being, discover, investigate, and tabulate the different sides of his nature, and endeavour to learn both the range and limit of his capabilities of training and expansion. We must also regard him in connection with his surroundings and consider what methods will best enable him to conform to, utilise, and even improve his environment.

The Nature and Constitution of Man, Etc.

(*a*) Man is an animal, having a *body* to be trained.

(*b*) Man is a rational animal, possessing a *mind* (intellectual and emotional) to be developed.

(*c*) Man is a moral animal with a *will* to be guided, chastened, or strengthened.

(*a*) To train the Body a knowledge of Physiology must be acquired, and to secure the fitting conditions of health, Hygiene must be studied.

(*b*) To develop the Mind an acquaintance with Psychology, Logic, and Æsthetics is necessary.

(*c*) To guide the Will some scheme of Ethics or Moral Philosophy is absolutely requisite.

Further, the error of studying the Body, Mind, and Will merely as *separate* entities, and the mistake of disregarding their intimate relationship and action and reaction upon one another, must be avoided.

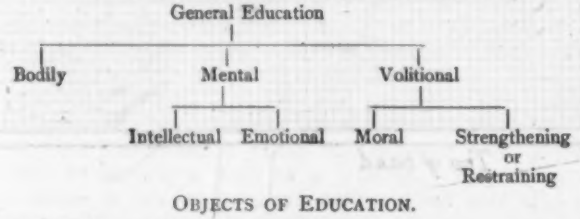
Unsymmetrical Constitutions.

No two blades of grass and no two men's faces are exactly alike. A similar statement may be made with much greater force if we say that no two human beings are positively identical in body, mind, and will. Not only have we all our peculiar corporeal, mental, and volitional characteristics, but the relative importance of each of these to each other and to the whole being is exceedingly inconstant. Some persons from their birth display most strikingly the animal part of of their nature, others exhibit juvenile precocity of ratiocination and emotion, whilst with many the will predominates.

Hereditary influence here plays a great part, and every experienced teacher cannot but have been considerably assisted in solving problems connected with individual scholars by the light afforded through the training of elder members of the same family.

Moreover, we must remember that in the same individual the relative importance of the constituents of his being is constantly altering. In childhood and early maturity the body and the will exercise greater influence upon the mind than during middle age, and in this respect there is a marked difference between a child of five and one of fourteen.

Table of Elucation as Shown by Man's Constitution.



Objects of Education.

Broadly speaking, these must be—

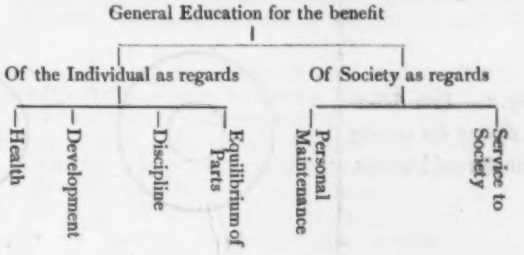
(*a*) the securing of soundness, development, and discipline, whether of the body, mind, or will.

(*b*) the maintenance of a fair equilibrium between the human constituents.

(*c*) the perfecting of the individual considered by himself.

(*d*) the adaptation of the man to external conditions, whether of nature or society.

Table of Education according to its Objects.



Inter-relation and Correspondence between the Branches of Education.

Fortunately these different views of education do not lead us to any great extent into divergent paths. For instance, to secure perfect bodily training, moral training must not be neglected; to attain unto the greatest mental vigour (we speak in general terms) soundness of body is essential; and the will, to be effective, must be stimulated or restrained by reason.

Also the perfection of each individual conduces to the advancement of society, the discharge of social duty advances the individual, and the theoretical considerations which determine the nature of education can generally be fulfilled by proceeding on practical lines.

All these coincidences might have been presupposed by the necessity of a correspondence between the internal and external conditions of human existence.

(To be continued.)

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PRACTICAL NEEDLEWORK.

BY J. W. WARREN.

Inspectress of Needlework, Leicester School Board.

As five months have gone by since my last paper on this subject, it will be necessary to recall the work in the two articles then given. That in the September issue referred to the Gathering specimen, with illustration, and that in the October, to Flannel Patch and Darning on stocking web. This month I give a few directions for the button and hole, which complete the specimens of the IV. Standard and a suggestion as to garments.

Perhaps no useful work presents so much real difficulty to the teacher as this. I will therefore take the points *seriatim*. The instructions call for *a fixed band, a buttonhole* with different ends, and a *linen button sewn on*.

General Remarks.—Do not ignore the practical part; let your band be along the line of selvege. Always let the button be upon the left side, and see that the buttonhole has its *curved end nearest the edge of band* and runs parallel with it. I have found these all reversed and a total disregard evinced as to the need for being particular; but I believe the Framers of the syllabus had these points in view, and when specimens are overlooked by a woman the fact is never disregarded, but a far higher reason for the correct teaching is its practical value. When such a specimen is complete it should represent in miniature a band, as for drawers or flannel petticoat. (See diagram No. 4.) In order to gain the memory of the child, it will be well to let her in imagination button behind the small band as when dressing a doll.

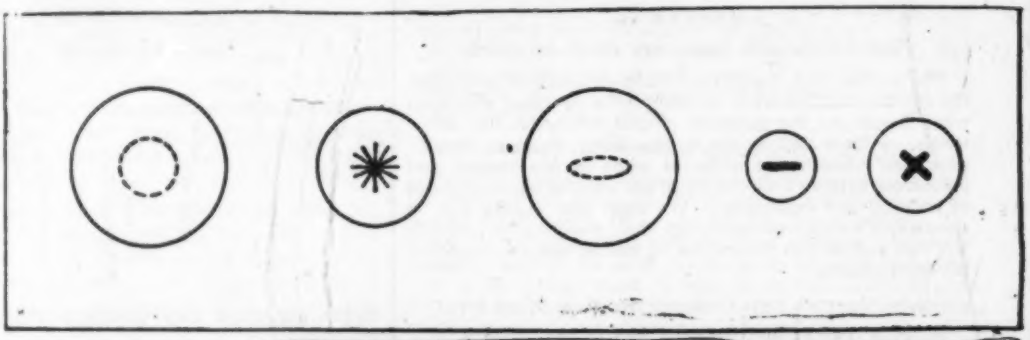

Fig. 1.—Five different shapes for sewing on unpierced buttons.

Fig. 2.—Specimen shows start on right side and stemming of button.

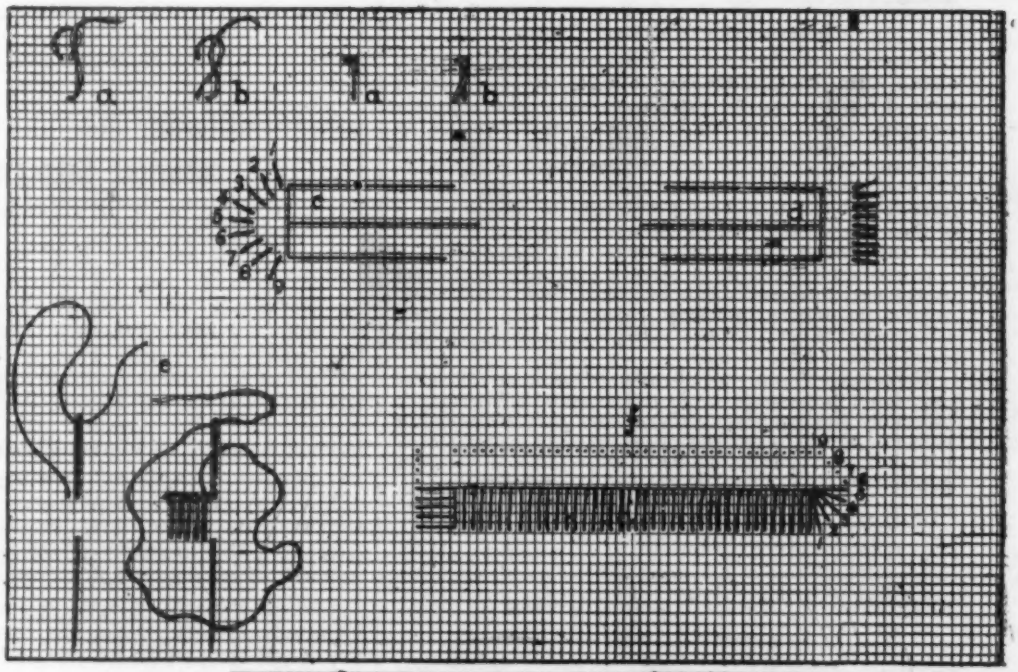

Fig. 3.— Button-holes; canvas showing stitch, start and finish.

a. Correct start from chain edge. *b.* Wrong start from lower edge. *c.* Button end threads cut open to show how they are placed. *d.* Button end threads cut, showing their disposition. *e.* Positions of needle and thread. *f.* Half a button-hole, showing work by thread.

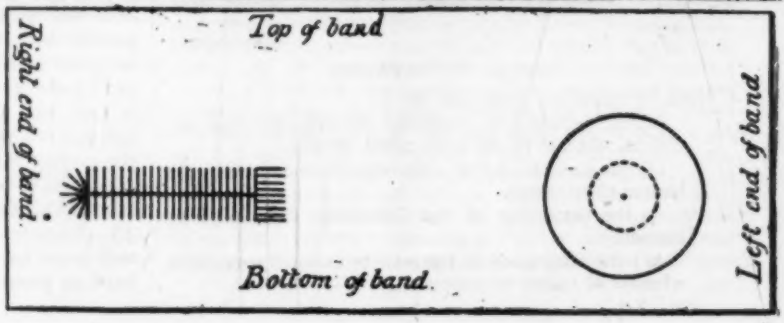

Fig. 4.—Specimen as required by Education Department.

The *end* to be attained in the button-hole will never be forgotten if the child have the reason for the round end given—it is to *give room* for portion of button taken up in the fasten, while the *braced* or *barred* end is to keep the hole partially closed when the button is in, to give strength, prevent tearing, and to give general neatness and finish. Spend an hour on thoroughly exhausting this subject by referring to jacket buttons and holes, tailors' devices, button-holes for *studs* two barred ends, (no space needed), babies' clothes two round ends (ease and rapidity in buttoning). I think enough has been said about this, but to the true teacher it will perhaps be useful.

To begin with button-sewing in the school the two should be taught alternately. Buttons are sewn on in three or four different ways; (see diagram). The first is perhaps the best and most used; the second, though pretty, will bear very little strain; the third is exceedingly strong and should be much more used than it is, the stitching in the ellipse is along the line corresponding to the button-hole and causes it to sit well; the fourth is the same thing with sewn stitches, and the last is done by sewing over into imaginary holes.

All these styles need, and indeed an invariable rule is, to bind the button when the attachment is complete; and before breaking off at finish this should be carefully done, not too tightly. Its use is to lift the button from material and to prevent the wear round the sewn part. Six or four threads are sufficient to cover the stitches, after which the needle is brought out on wrong side and a neat fasten off made. Strong cotton is necessary in sewing on a button, and when teaching first use a button an inch in diameter; afterwards vary it. When using one sized button, have all button-holes *made to that particular size*, begin the sewing on by neatly fastening on right side of band so that your fasten lies *under* button and not on wrong side (no knot). Lightly mark with black lead the line for stitches, on button the circle or ellipse must be true to avoid strain on particular stitches. Of the modes given the second and fourth are more suited for small buttons. The circle, star, or ellipse, should be proportionate, the former embracing only one third the diameter of button.

The button-hole stitch.— This must first be taught, leaving the cutting to be done last. First let your pupils use a fine Java canvas, canvas cloth, or coarse linen, where threads can be counted and used. A careful analysis of the stitch shows, first, that it lies at right angles with slit on the sides; second, that the edge is ribbed or chained; third, that this ribbing can be made immediately after insertion of needle while it is yet *in situ*, or afterwards before finally closing up the stitch. See diagram, specimen *e*.

Prepare for class pieces of white canvas previously tacked on foundation of cheap soft coloured print or sateen; let these be at least 10 × 5 inches. They will last the whole year for the initial steps and will save all other trouble. Use a 6 needle and 36 cotton (not embroidery cotton), *tie the cotton in the needle* to teach the stitch on canvas. My reason will be seen later on.

The *first* stitch should be taken through at ribbed part, as shown, and not, as some workers advise, at bottom part. In a cut button-hole this first insertion would be *one thread* to left of *slit*. This plan avoids a contorted double first stitch. Many otherwise good holes are spoilt by this omission. Fancy needle workers know the plan well and practise it too, see *a* and *b* diagrams.

Now a word as to the details of each stitch. Work from left to right, always beginning at the left hand inner corner of slit. Teach your children to bring the needle out a little (one thread) beyond each previous stitch, point towards worker, needle straight, right arm lifted. Now the next step may be the bringing of cotton round the point of needle while it is still fixed, immediately on drawing needle through, reverse hand (position of), thereby turning needle point direct from worker, pull slowly, always picking up with finger and thumb cotton near the loop to ease and prevent twist or catch, pull firmly, regulating direction of stitch with needle point; bear *towards left*, rather than not, in pulling, as there is a tendency for the stitches to spread fan-like at the chain edge.

At least two lessons should be taken with the stitch practice straight, after which the ends should form separate lessons, beginning with the *bar*, which in nearly all ordinary holes may consist of nine stitches, as does the curved end. This number allows one thread for slit, and four on each side for depth of stitches. But children must be taught that ends must always reach from end of side stitch to that of left, the bar stitches must be taken *through* material and *ribbed*, the first stitch begun as in first at the side at ribbed side, after which each is to be begun at the other end. My meaning will be better *seen* in diagram than described, look carefully at first needle in *e*.

No strengthening threads are needed either in sides or ends of button holes. On canvas it will be well to face your practice rows and leave ends, so that the bar can be taught from the first in its usual situation.

Use your needlework frame in teaching this stitch, and also the black board.

Round end. This also forming separate lessons at first should, of course, in the ordinary hole occur after the last stitch of first side. Care is needed to point out that each insertion is in the same place. Each coming out of needle point tends to make a semi-circle, of which the last side stitch on left and first side stitch on right are the radii.

I prefer taking this step thread by thread, as so much error prevails. Please look at diagram, in which I have *cut open the threads* as a ready means of clearly showing their disposition.

1st stitch; needle point exactly as for another side stitch, only do not chain it.

2nd stitch; insert same place, needle point out one thread nearer insertion, one thread further away in slanting direction; see that two threads, crossed, lie between your stitches one and two.

3rd stitch; one *thread below*, one thread further on; insert in same place as before.

4th stitch; same insertion but one thread lower, one further on which brings you parallel with slit.

5th stitch; insert as before but come out on a line with 4th, and in space running directly with the slit.

6th stitch corresponds with 4th.

7th " " " 3rd.

8th " " " 2nd.

9th " " " 1st.

Left end of band

Some people chain these stitches and it is, in my opinion, better a simpler chain being used than that of sides; but in teaching it in a Government school it will be wise to omit the chain edge.

When these slips have been taught with patience, a child will always get accurate work who may not succeed so well in excellent results, which come only and always with continued practice.

Blind button-holes (without slit), and on coarse material or canvas, should be done now, later on the calico finally used, and then the cut may follow. This should be done by the child herself, a pencil line will guide and the material should be folded. Cut between the threads if at all possible; scissors should be very sharp. A chisel or a knife should not be used for these holes, nor is the *button-hole gauge* very useful.

Having now gone through the four specimens of the IV. Standard, my intention next month is to give one or more patterns of suitable garments, with advice as to the material and mode of putting together.

To refer briefly to the chain hole as done by some workers, see diagram. The result is the same, but with silk and soft loose strands it is a better plan than that explained above and taught most generally.

Coloured cottons should be used in all these specimens.

To be continued.

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SCHOOL LAW.

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AND

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CHAPTER I.

THE LEGAL RELATION OF TEACHER AND PARENT.

A Schoolmaster is 'in loco parentis.'

The relation of a schoolmaster to the children under his care is a quasi-parental one, and his responsibility is similar to that of a master with regard to his apprentices. Both master and schoolmaster are regarded by the law as taking to a certain extent the place of the parent, and are therefore said to be 'in loco parentis.'

How this quasi-parental relationship is constituted.

In the case of private schoolmasters and the headmasters of public schools, which do not come under the Elementary Education Acts, this quasi-parental relationship arises from a contract made between the parent or guardian of the child and the schoolmaster, either in his personal capacity or as the agent of the directors of the school. The parent, who is under a legal duty to protect, maintain, and educate his children, says, in effect, to the schoolmaster, 'Do you, in return for such and such fees, promise to provide my child during a certain part of the year with adequate education; and if the school be a boarding school, with a sufficient amount of proper food and with healthy lodging?' The schoolmaster replies, 'In return for such and such fees, I do promise.' The parent is then legally bound to pay the fees agreed on, and the schoolmaster is bound to provide the child with the education, food, and lodging which were the subject of the agreement. If either party fails to fulfil his part, the other party has an action against him for breach of contract.

With regard to elementary schools the legal relation of teacher and parent does not depend on contract. In an action* brought by the London School Board against a parent for arrears of school fees, it was held that a parent sending his child to a public elementary school in discharge of a duty imposed on him by statute, does not enter into any contract, express or implied, to pay fees for the child's instruction, and, consequently, arrears of such fees are not recoverable by action in the County Court.

Compulsory attendance under the act of 1876.

By the Elementary Education Act of 1876 the parent of every child under fourteen is placed under the legal obligation to see that the child receives efficient elementary instruction in reading, writing, and arithmetic. If this duty be neglected, the local authority—the school board, or school attendance committee, of the district—after due warning to the parent, is bound to complain to the court of summary jurisdiction, which will proceed to make an attendance order. The parent, however, has three valid excuses: (i.) That the child is under efficient instruction; (ii.) That there is no public elementary school open within two miles, measured according to the nearest road from the residence of the child; (iii.) That the absence from school of the child was caused by sickness or other unavoidable cause.

Where the order is not complied with, in the first case of non-compliance, if the parent does not appear, or fails to satisfy the court that he has made every reasonable effort to enforce compliance, the court will inflict a penalty not exceeding five shillings; but if it is satisfied that reasonable effort on the parent's part has been made, the child will be sent to a certified industrial school.

In any subsequent case of non-compliance, the child may be sent to an industrial school, or a penalty not exceeding five shillings may be inflicted; or both these courses may be taken, at the option of the court.

It is important to notice—(i.) That the term parent in this connection has a much wider meaning than it ordinarily has. (ii.) That the child's being refused admission to the school, in consequence of the non-payment of the school fee, is no excuse. (iii.) That the parent's poverty is no excuse.

Who is a Parent?

The term 'parent,' under the Elementary Education Acts, includes the guardian of the child, every person liable to maintain the child (father, grandfather, mother, grandmother, &c., under certain circumstances), and any person having the actual custody of the child.

In the absence of a father, through desertion, or the pursuit of his calling, the person having the care and custody of his child is liable. Thus, where a child was living with its mother, and under her control, its father

* London School Board *v.* Wright.

being at sea, it was held that the mother was liable.* The conditions of the Act, however, must be observed. A complaint against a widow was dismissed under the following circumstances:—A father who had been ordered to send his child to a certain school died while the order was still in force, and his widow, who was aware of the order, but had never been served with a copy or minute of it, was summoned for non-compliance. It was held that since she had not been warned, had had no option of selecting a school, had not been summoned to show cause why the order should not be made, and had not been ordered to cause the child to attend, there was no case against her.†

Refusal of Admission in consequence of Non-payment of Fees.

It has been pointed out that arrears of elementary school fees cannot be recovered in the County Court. It is permissible and customary to demand that they shall be paid in advance. Where, therefore, a parent hnows that in consequence of non-payment of the fees his child will not receive instruction, and will not be admitted into the school, his sending the child without the school fee is not a compliance with the attendance order.‡

Poverty of Parent is no excuse.

The inability of a parent to pay his child's school fee is no excuse for not sending the child to school. His duty is either to go to the School Board for remission of the fee, or to apply to the guardians of the parish in which he resides for payment of the same.

The School Board, by the Act of 1870, is empowered, with the sanction of the Education Department, in such cases to remit the whole or part of the fee for a renewable period not exceeding six months, and such remission is not to be deemed parochial relief.

The 10th section of the Act of 1876 provides: (i.) That the parent, not being a pauper, of any child, who cannot by reason of poverty pay the ordinary fee for such child at a public elementary school, or any part of such fee, may apply to the guardians having jurisdiction in the parish in which he resides, and it shall be their duty, if satisfied of his inability, to pay the said fee, not exceeding threepence a week, or such part of it as they consider him unable to pay. (ii.) Payment under this section shall not disqualify the parent for voting at elections. (iii.) Payment under this section shall not be made on condition of the child's attending a public elementary school other than such as may be selected by the parent, nor refused because the child attends, or does not attend, any particular elementary school.

Application of the Compulsory Attendance Clauses of Act of 1876.

The Act of 1876 has to be read with the Elementary Education Act of 1880, and, since the latter Act came into force, applies to children between the ages of thirteen and fourteen.

Compulsory Attendance under the Act of 1880.

By the Elementary Education Act of 1880: (i.) The local authority of every school district, school board, or school attendance committee is obliged to make bye-laws requiring the parents of children between the ages of five and thirteen to attend school, under a penalty not exceeding, with costs, five shillings, the same excuses being specified as under the Act of 1876.

Other reasonable excuses may also be admitted. Where a child had only made 66 attendances out of a possible 158, but the parent had always paid the fees, had always sent the child in time for school, and had punished the child on the only two occasions on which he was informed it arrived too late to have its attendance marked, he was held to have satisfied the requirements of the Act.*

The parent may also transfer his child from one school to another, and the School Board cannot call on the parents to give reasons for not sending their children to school.

(ii.) Bye-laws requiring children between ten and thirteen to attend school must provide for the total, or partial, exemption of such children from the obligation to attend school, if H.M. Inspector certifies that the child has reached a standard of education specified in the bye-law. In some bye-laws this standard is as low as the Third Standard, in others as high as the Sixth Standard.

Indirect Compulsion.

The attendance of children in public elementary schools is enforced indirectly by restrictions on their employment, which will be dealt with elsewhere, and by provisions in the Acts of 1876 and 1880, which made the attendance of children at school as required by the bye laws a condition of outdoor relief.

The Parent's rights with regard to the Secular Instruction given to his Children.

The secular instruction given by the schoolmaster to his pupils lies for the most part outside the province of the parent. As a general rule, the latter is not expected to concern himself with such matters as the details of time-tables and minute criticism of the methods of teaching employed in the school. As his child's natural protector, it is, however, his duty to make a representation to the schoolmaster of any conduct of his schoolfellows, or teachers, which affects his happiness or health. In many secondary schools this watchfulness on the part of the parent is especially invited. Time-tables are drawn up for the day pupil's preparation of lessons at home, in which a definite period of preparation is given for each lesson,* and the parent is requested to report any exceeding of the proper time by the child, and any signs of over-work. In private schools, though the parent has no claim to interfere with the general curriculum of the school, he can generally secure the exemption of his children from certain subjects of instruction by agreement with the schoolmaster. In public schools, speaking generally, unless the child's health is affected, the usual curriculum must be taken. The parent has a right to represent to the schoolmaster that his children are not making satisfactory progress with their studies, for this is a matter affecting their future well-being.

The Parent's rights with regard to the Religious Instruction given to his Children.

To decide in what religion his children shall be educated is regarded by English law as so peculiarly the province of the father that an agreement made before

* Hance *v.* Burnett.
† Hance *v.* Fairhurst.
‡ Saunders *v.* Richardson.

* Belper School Attendance Committee *v.* Bayley.

marriage between a husband and wife of different religious opinions that the children shall be brought up in a different religion from the father's, is not binding on him. In technical language, he cannot release this right. The question of religious education is therefore very carefully provided for in the Endowed Schools Act of 1869, and the Welsh Intermediate Education Act of 1889, so far as secondary education is concerned; and the Elementary Education Acts regulate with equal care the religious instruction given in elementary schools.

Religious Instruction in Endowed Day Schools.

With regard to day schools, section 15 of the Endowed Schools Act of 1869 provides the following exemption for day scholars in schools other than those maintained out of the endowment, or forming part of the foundation of any cathedral or collegiate church, or endowed schools made specifically denominational* by the express terms of the original instrument of foundation, or of the statutes or regulations made by the founder, or under his authority in his lifetime, or within fifty years after his death.

(i.) The parent or guardian, or person having the actual custody of any scholar attending such school as a day scholar, may claim, by notice in writing addressed to the principal teacher of such school, the exemption of such scholar from attending prayer or religious worship, or from any lesson or series of lessons on a religious subject, and such scholar shall be exempted accordingly.

(ii.) A scholar shall not by reason of any exemption from attending prayer or religious worship, or from any lesson or series of lessons on a religious subject, be deprived of any advantage or emolument in such endowed school or out of any such endowment to which he would otherwise have been entitled, except such as may by the scheme relating to the school, be expressly made dependent on the scholar learning such lessons.

(iii.) If any teacher, in the course of other lessons at which any such scholar is, in accordance with the ordinary rules of such school, present, teaches systematically and persistently any particular religious doctrine from the teaching of which any exemption has been claimed as afore provided by this section, the governing body shall, on complaint made in writing to them by the parent, guardian, or person having the actual custody of such scholar, hear the complainant, and inquire into the circumstances, and, if the complaint is judged to be reasonable, make all proper provisions for remedying the matter complained of.

With regard to Welsh endowed day-schools, Section 4, Sub-section 3, of the Welsh Intermediate Education Act of 1889 provides in addition to the above three regulations:—

(i.) That no religious catechism or religious formulary which is distinctive of any particular denomination shall be taught to any day scholar attending such school.

(ii.) That the times for prayer or religious worship, or for any lesson or series of lessons on a religious subject, shall be conveniently arranged for the purpose of allowing the withdrawal of a day-scholar therefrom, as provided above.

* Even in this case the Act of 1869 exempts a day-scholar from attending prayer or religious worship, or lessons on a religious subject, when such exemption has been claimed on his behalf.

Religious Education in Endowed Boarding Schools.

With regard to the religious instruction given in them, English and Welsh endowed boarding schools (other than cathedral and specifically denominational schools) are on precisely the same footing. Section 16 of the Act of 1869, and Section 4, Sub-section 3, of the Act of 1889, provide:—

(i.) Where the parent, or guardian, or person having the actual custody of, any scholar about to attend such school, desires the exemption of such scholar from attending prayer or religious worship, or from any lesson or series of lessons on a religious subject, such scholar may withdraw during religious worship or instruction with the consent of the persons in charge of the boarding-houses.

(ii.) Where the persons in charge of the boarding-houses of such a school are not willing to allow such exemption, it shall be the duty of the governing body to make proper provisions for enabling the scholar to attend the school and have such exemption as a day scholar, without being deprived of any advantage or emolument to which he would otherwise have been entitled, except such as may by the scheme be expressly made dependent on the scholar learning such lessons.

Religious Instruction in Public Elementary Schools.

Religious instruction in public elementary schools is regulated by Section 7 of the Act of 1870, which provides:—

i. It shall not be required as a condition for the admission to, or continuing in school of any child, (i.) that the child shall attend or abstain from attending any Sunday school or place of religious worship; or (ii.) that he shall attend any religious observance or any instruction in religious subjects in the school or elsewhere, from which observance or instruction he may be withdrawn by his parent; or (iii.) that he shall, if withdrawn by his parent, attend the school on any day exclusively set apart for religious observance by the religious body to which his parent belongs.

ii. The time, or times, during which any religious observance is practised, or any instruction in religious subjects is given at any meeting of the school, shall be either at the beginning or the end of school, and shall be inserted in a time-table to be approved by the Education Department, and to be kept permanently and conspicuously affixed in every schoolroom, and any scholar may be withdrawn by his parent from such observance or instruction without forfeiting any of the other benefits of the school.

iii. It is no part of the duty of Her Majesty's Inspector to inquire into any instruction in religious subjects given at such school, or to examine any scholar therein in religious knowledge, or in any religious subject or book.

With regard to this section it may be noted, (i.) that the parent's notice of withdrawal may be written or verbal, and that where the child fails to attend but no intimation has been given of the wishes of his parent, those wishes should be ascertained. (ii.) It is the duty of Her Majesty's Inspector to see that the prescribed amount of time for secular instruction is secured in the time-table. (iii.) Where a vicar distributed on Sunday to the children attending a National day-school—a

public elementary school—prizes for secular knowledge, the Education Department expressed an opinion that prizes for secular knowledge should be open to all scholars attending the school, and should be distributed when religious instruction is not given.

Regulations of London School Board with regard to Religious Instruction.

The regulations of the London School Board with regard to religious instruction, prayers, and hymns are of interest because of their adoption by a large number of other school boards. The most important rules thus laid down are:—

1. The Bible shall be read and explained, no attempt being made to give doctrinal explanation.

2. Such explanation shall be given by the responsible teachers of the school.

3. Prayers and hymns shall be used when religious observances may be practised under the Act, but they shall be of an undenominational character.

4. Children withdrawn from religious instruction shall receive separate instruction in secular subjects.

5. A syllabus of subjects of Bible instruction for one month in advance shall be prepared by the teacher and forwarded to the clerk of the board at the beginning of each month.

The Schoolmaster's Disciplinary Rights.

A schoolmaster has the legal right to enforce obedience to his reasonable commands, and to punish faulty conduct in his pupils within certain well-defined limits. 'By the law of England,' says one of our most eminent judges* in the leading case bearing on this subject, 'a parent or a schoolmaster—who for this purpose represents the parent and has the parental authority delegated to him—may, for the purpose of correcting what is evil in the child, inflict moderate and reasonable punishment, always however with this condition—that it is moderate and reasonable. If it be administered for the gratification of passion or of rage, or if it be immoderate and excessive in its nature and degree, or if it be protracted beyond the child's power of endurance, or be inflicted with an instrument unfitted for the purpose, and calculated to produce danger to life and limb; in all such cases the punishment is excessive, the violence is unlawful, and if death ensues it will be manslaughter at least.'

In the case which formed the occasion of this statement of the law, a schoolmaster endeavoured to justify the beating of a boy of thirteen with a thick stick and a skipping-rope for two hours, in consequence of which the boy died, by the plea of the father's consent to the chastisement. The boy was obstinate, and the master wrote to his father that if he were his own child he would subdue his obstinacy by chastising him severely, if necessary, again and again, and would continue the chastisement, if he held out, for hours. The father replied, 'I do not wish to interfere with your plan'—a statement which led to the boy's death, but did not in any way excuse it, for a father has no power to authorise the excessive chastisement of his children. There is no doubt that the schoolmaster ought to have been indicted for murder, not for manslaughter. In cases of unlawful chastisement where death does not ensue in consequence of it, the schoolmaster is guilty of assault and may be proceeded against criminally, or in a civil court.

The right of correction is generally expressly limited by the employers of teachers, and teachers, if they transgress the rules thus laid down for them, break the terms of their contract of employment, and render themselves liable to dismissal. The following rules have been laid down by the London School Board with regard to corporal punishment:—

1. Every occurrence of corporal punishment must be formally recorded in a book kept for the purpose.

2. Head teachers must exercise the utmost caution in inflicting corporal punishment, so as never to strike a child on any part of the head, either with the hand or with any instrument whatever.

3. Corporal punishment must not be inflicted during school hours. The name of any child to be punished shall be put down, and the cases of corporal punishment be dealt with at a particular time set apart for the purpose. Head teachers may inflict immediate corporal punishment in exceptional cases which, in their judgment, require such a course; but a special report of each case must be made by them in the punishment book, giving in full the reasons for departing from the ordinary rule of the board.

4. Assistant teachers and pupil teachers are absolutely prohibited from inflicting such punishment. The head teacher is held directly responsible for every punishment of the kind.

* C. J. Cockburn in R. *v.* Hopley.

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WELL-KNOWN TEACHERS AT WORK.

I.—MR. JAMES SCOTSON, *Central Higher Grade School, Manchester.*

Amongst the teachers of English State aided schools Mr. James Scotson is one of the most widely-known and one also of the most powerful in his personal influence, and this for several reasons—for his strongly marked character as a man as well as a teacher, for his enthusiastic devotion to the cause of education, for the unique features and the remarkable success of his professional career.

Believing that a sketch of Mr. Scotson's experience would be likely to prove useful and interesting to teachers in general, we presumed on our long and friendly relations with him to seek by a personal interview, a visit to his school, and by subsequent correspondence, the means of making our readers acquainted with his work and opinions.

Come with us first to the scene of his duties, the Central Higher Grade School in Deansgate, Manchester. The building is a rather imposing one externally, but its appearance scarcely gives one an adequate idea of the important work carried on within its walls; for, though it is in a good position in one of the main thoroughfares of a busy city centre, it abuts close on to the street pavement, and has to stand comparison with large and lofty warehouses and business premises in the immediate neighbourhood. Through Mr. Scotson's kindness we have the pleasure of accompanying our remarks with a view of the school buildings.

Entering the principal door of the school we are shown into the head master's sanctum, a pleasant, lofty, well-furnished and comfortable room on the second floor, where the pupils' parents and other callers are able to make inquiries and converse with our friend without other distraction than may be occasioned by the rumble of passing tram-cars, lurries, and other vehicles. It does one good to see Mr. Scotson's genial expressively mobile face, and to hear his cheery voice as he welcomes us with a hearty greeting, and in a pleasant bustling way offers to show us over the school. On hearing the object of our visit he expresses the utmost willingness to answer any questions and his wish to be of as much service as he can, for, says he, 'I have no secrets, and shall only be too happy if I can assist a little in improving the education of the country.'

The building occupies four floors and a basement, contains thirty-seven rooms, and affords accommodation for 1,500 pupils. Proceeding in our tour of inspection from the lowest floor upwards, we find that the basement is utilised as a gymnasium for the boys, a kitchen for teaching cookery to the girls, a dining-room for boys and girls who live a long way from the school and cannot go home to dinner, and a kitchen for cooking or warming the dinners brought by the scholars. The arrangements of kitchen and dining-room are of an extremely satisfactory kind.

In answer to questions on the physical education of the children, Mr. Scotson refers to the impossibility of providing in the heart of the city an adequate open air playground. 'This is less needed, because most of the scholars live on the outskirts of the town, and have a good deal of outdoor exercise in going between home and school. Then we make effective use of the gymnasium, where the boys learn club exercises, as well as the usual movements and practices of a modified military drill. Also a football club and a swimming club have been established in connection with the school, and practise regularly in their proper seasons.'

On the ground floor there is a private room for the head mistress, a cloak-room, and three class rooms, able to accommodate 120 girls.

CENTRAL HIGHER GRADE SCHOOL, DEANSGATE, MANCHESTER.

On the first floor we find eight rooms, four of which are occupied by the boys, and four by the girls. There is also a girls' cloak-room. It may be mentioned here that the girls are under a head mistress and staff of assistants. The head mistress is Miss Melicent Moss, who has filled this important position with conspicuous success for more than thirty years.

On the second floor is the head master's room, already described, a lavatory, eight class rooms, affording accommodation for 440 pupils, and a boy's cloak-room. 'One of these rooms,' Mr. Scotson remarks, 'is specially set apart for lessons in Latin, German, and Shorthand.' Another we find is fitted up in a very complete style as a physical laboratory, in which a dozen pupils are able to work comfortably at practical demonstrations.

On the third floor are three large rooms. These are entirely devoted to the teaching of Drawing, for which they are admirably adapted by special lighting and other arrangements. One is called the Freehand and Model room, another the Cast Room, and the third the Machine Drawing Room. The models, casts, and apparatus are very abundant and well chosen. About 200 pupils at one time can be taught Drawing on this floor.

The fourth floor is specially devoted to Science teaching. Here is a laboratory fitted up with every appliance and apparatus for teaching Practical Chemistry in all its stages, and affording accommodation for eighty pupils at one time; also a balance-room for the illustrations in advanced science. Besides these rooms there is a lecture hall, seated for 120 pupils.

As we make our somewhat rapid inspection of the building we are constrained to admire the excellent way in which its arrangements have been made for fulfilling its purposes, and this strikes us all the more when we consider the limitations of space and other conditions arising from its central position. At every turn in our progress we have seen also in the steady business-like air of the work going on abundant indications of the spirit by which the success of the institution is maintained.

'Now, Mr. Scotson, we see that you have good reason to be proud of your school. We believe it would be

interesting if you could tell us something of its origin and growth. It sprang, did it not, from a voluntary school?'

'Yes, or rather it is really a continuation of two voluntary schools—the New Jerusalem or Peter Street School, and the Lower Mosley Street British School, both of which were in neighbouring thoroughfares near the Free Trade Hall and the Theatre Royal. The Peter Street schools were opened by a Mr. Moss in the year 1827, and were attached to the Swedenborgian Church. They were almost free schools. Not only were the fees low, but books and stationery were supplied free. The Swedenborgians considered that the only chance there was of their doctrines spreading was through a good education. In 1848 the school managers applied for a Government grant, and the schools had at that time, under the excellent organization and marvellous energy of Mr. Moss, gained such a reputation that the Government gave a grant, although the master was not certificated.'

Jas Scotson

'Excuse the interruption, but when did your own connection with the school begin?'

'Ah, it's a long time ago now! I became a scholar in Peter Street School in 1843, and was educated for a fee of a penny per week. So from the time I have now reached in the school's history I can speak from personal recollection. I became a pupil teacher in 1849, and after completing a five years' apprenticeship I was appointed assistant. In 1857 I sat for my certificate, and was placed in the first class, and was shortly afterwards appointed head master for Government purposes, Mr. Moss retaining the nominal position for many years after. The work of the school was then largely shared by pupil-teachers, of whom I had at one time as many as ten under my charge. For many years the schools were examined by the late Dr. Morell, and invariably gained excellent reports from him. On one occasion a full account of the school, with a copy of the time table, was given in the Blue Book containing the minutes of the Committee of Council on Education.'

'When and how did your school become a Higher Grade School?'

'Well, it gradually assumed that character while under voluntary management. The change was accomplished by eliminating one by one the lower Standards, and raising the fees until, in the year 1880, the majority of the pupils were in Standards VI., VII., and ex.-VII. As the managers were all in favour of schools being placed under public control they handed the schools over to the Manchester School Board, and, for the use of the building, charged simply the ground-rent of £25 a-year.'

'You said that two schools were amalgamated to form the present one?'

'Yes: the other was the Lower Mosley Street British School, which was under the management chiefly of leading Unitarians. In character it was very similar to the Peter Street School, with which it long maintained a friendly rivalry. Its excellent head master, our good friend Mr. George Smith, a teacher unsurpassed for the earnestness, thoroughness, and success of his educational efforts, unfortunately broke down in health, and there was no prospect of his being able to resume the onerous duties which he had fulfilled in so self-sacrificing a spirit. Under these circumstances the schools were transferred to the Board, and shortly afterwards joined to Peter Street with myself as head master. The Board then secured a site in the neighbourhood and raised the building in which we now are, to accommodate the children above Standard IV. from the two older schools. During the first month from the opening of the school in 1884 more than 500 new pupils were admitted. Thus the school became full at once and has remained so ever since, without receiving periodical drafts of children from other Board Schools.'

'Would you object to state shortly what are the chief characteristics of the Higher Grade School?'

'I will do so with pleasure. In the new building there are practically two schools, one containing Standards V., VI., and VII., and the other all those boys and girls who have passed the Seventh Standard. This latter is a fully organised Science and Art School, recognised by the South Kensington Department. At the present time there are 1,400 good names on the registers, nearly 1,000 being boys and 400 girls. Of the boys there are more in the Science School than in the Standard or Higher Elementary School. The average attendance of boys this year is, in the Science Department 442, and in the

Standard School 374. Our staff, I think I may say, is quite adequate to the work to be done, and I am glad to add its members are thoroughly loyal to the best interests of the school and work harmoniously together. In the Boys' School I am assisted by 16 masters and assistants, of whom two are graduates and three undergraduates of London University, and several are former pupils of my own. The head mistress has under her a staff of six assistants. Then there are, besides, special masters with high qualifications for Science, for Engineering, and for Art, with several assistants. There are also special teachers for French, for German, and for Cookery. The curriculum for the Standard School includes all the ordinary branches of instruction adopted in a good government school with elementary mathematics. In the Science School the subjects taught are Practical Plane and Solid Geometry, all stages of Mathematics, Machine Drawing and Construction, Theoretical Mechanics, Chemistry, Physics, Physiography, and Physiology. In the Art Department the course of instruction includes the subjects of second and third grade Art. Commercial subjects, including Book-keeping, Shorthand, and Type-writing, are taught to those who specially require them. The details may perhaps best be gathered from the time table, with a copy of which I shall have pleasure in supplying you.'

This is printed on p. 29.

'And now, Mr. Scotson, what are the fees charged to the pupils?'

'The regular fee is 9d. a week for each boy or girl. In addition to this, children of ratepayers are charged 1d. per week for books and stationery, but children of non-ratepayers pay 4d. per week. The School Board are prepared, however, to remit the whole or a part of the fee in cases where the parents are unable to pay the usual fee.'

'The results of the education given here have, we presume, been satisfactory?'

'Eminently so. Perhaps I may be allowed to state a few facts in support of this. Since the establishment of the Central School, 20 of our pupils have succeeded in gaining National Scholarships of £60 a year for three years, or Royal Exhibitions of £50 a year for three years. Eight of these are now Associates of the Royal College of Science, South Kensington, where two of them are also Science Demonstrators. Two are Associates of the Royal School of Mines, and one is an Associate of the Royal College of Science, Dublin. In one year recently four of our pupils were named in the Honours Division of the London Matriculation List. Two have lately attained the B.Sc. degree in the Victoria University, one is now a scholar at Trinity College, Oxford, another at Trinity College, Cambridge, and one is House Surgeon at the Manchester Infirmary. But to speak of the present, I may mention that during the past year the total value of prizes and scholarships gained by pupils of these schools amounted to £1,500, the number of Science certificates gained at the Government examinations was over 1,300, and the number of Second Grade Art Certificates over 270. As many as 43 boys and girls obtained elementary school scholarships, worth £9, £12, or £15 a year.'

'That is indeed a brilliant tale of successes. It suggests a number of questions.'

'Well, I will do my best to answer them; but one at a time.'

'You refer to boys and girls as obtaining scholarships: now how do the girls compare with the boys?'

'Remarkably well. Out of the 43 elementary school scholarships, 18 were gained by girls, which is a very good proportion considering that the total number of girls is much less than that of boys. The Mc Kerrow Exhibition was awarded to a girl who was second on the list. The best mathematician amongst our present pupils is a girl; and a former exhibitioner of the girls' department has graduated as B.Sc. in Victoria University. The smaller total of girls is of course explained by the fact that there is not accommodation for more. The head mistress, Miss Moss, is an excellent teacher and has the advantage of long experience in the school; for, like myself, she has been associated with it during the various stages of its development.'

'How would you describe the relation of your school to the other elementary schools of the city?'

'When first established it was intended to draft boys and girls from other Board Schools after they had passed the Sixth Standard. This would probably have caused some jealousy and heart-burning among the other teachers, a result I should have sincerely regretted. But, happily, the school filled rapidly and maintained its

members by voluntary admissions. By means of the elementary school scholarships pupils from other schools may obtain admission to the Science School.'

'What would you say of the relation of your school to the Manchester Grammar School and other secondary schools?'

'Well, our Science and Art School is a kind of secondary school itself, in which we seek to lay the foundations and build up a sound technical training. The success is testified by the after career of many of our pupils, who hold good positions in chemical and engineering works. Boys wishing to have a classical education are encouraged to compete for open grammar school scholarships. Thus our school forms one of the rungs in the ladder that leads from the gutter to the university. One year there were three young men in residence in Balliol College, Oxford, who had gained open scholarships from the Manchester Grammar School, and who commenced their educational career in these schools. One of my former pupils gained the proud distinction of a double first-class at Oxford.'

'What difficulties have attended the establishment of your school?'

'There have been no real difficulties. Some slight opposition has shown itself, on the ground that it was no part of a School Board's duty to provide secondary education. This has been of little effect. But I do not wish to go into questions of educational politics. It suffices for me that the school maintains its character. One reason why we have had so little difficulty lies no doubt in the fact that the school has been a growth, a development, and not the result of a sudden new departure. Another reason is the fact of its financial success. The maintenance of the school is no burden upon the ratepayers, who have not to find a penny to maintain it. The only charge on the rates is for repaying the cost of site and building, and towards that annual charge the school contributes a considerable sum in the shape of a surplus of income over expenditure.'

'How will the adoption of free education affect this and similar schools?'

'That I can hardly say; but I do not think it will injure them.'

'Would you preserve their character by an admission examination or other mode of selecting pupils?'

'Yes; at present any boy who has passed the Sixth Standard and wishes to continue his education, can come to this school at the fee of the school he leaves, or, if his parents are not able to pay, the fee is remitted. If all schools are made free I presume boards will have the power of laying down such conditions of admission into their higher grade schools as will secure the attendance of those pupils only who are able to take advantage of the education they afford.'

'How is the work of the Standards in your school affected by the New Code arrangements?'

'The new system allows the continuous adoption of a natural, rational, and educational classification. Under the conditions of former Codes the natural principle of classification was adopted with all those pupils who being admitted in the second half of the school year were not eligible for examination, and with the rest for the first part of the year. In the last half of the year the classes had to be regulated by the rules of the examination. My belief in freedom of classification is based on experience as well as reason. It was remarkable to notice what good results were attained in many instances where circumstances permitted a different mode of classification from that which the requirements of the Code would suggest, I mean in the cases of those it was customary to call non-standard children. The records of the Science classes abound in marked successes of boys who by the strict application of a mechanical rule of promotion would have been unable to keep pace with the ordinary standard boys.'

'How are you affected by the attendance difficulty?'

'It is to us practically no difficulty at all. Scarcely any cases of absence occur except for illness, and this seems to count for very little. The pupils' parents belong almost entirely to the class who set a high value on education, but at the same time they are properly very considerate about the health of their children. Thus we have nothing like the same proportion of scholars never absent as they have in some ordinary board schools in poor neighbourhoods. There is another point I must not omit. The practice of going to spend holidays at the seaside, or in the country, is very general among the parents. They cannot in some cases have their summer holidays at the same time as the school holidays, and this accounts for a certain amount of absence. Taking all things into consideration we get almost as good an attendance as we can reasonably expect. The average attendance, compared with the number on the roll, exceeds 90 per cent., and it varies very little. Of course we do all we can to encourage good attendance: for example, one of the rules printed in our prospectus runs thus: "No excuse except illness is considered a sufficient cause for non-attendance, and in every case of absence a note of explanation must be sent by the parent. It is a well-known fact that nothing retards progress so much as frequent absence from school. The teachers therefore hope that all their pupils will make it a point of honour never to be absent from school, except in cases of absolute necessity, and thus not interfere with the progress of the class." In addition to the prizes and certificates given by the Board for good attendance, Moss Prizes have been established in memory of the first head master of Peter Street School. Each year one is given to the boy and one to the girl who have been respectively the greatest number of years present at every meeting of the school. They are generally taken by a boy and a girl who have never been absent for seven years. In the remarks I have had an opportunity of making at our annual concert, instead of exhorting the parents to help us in the matter of attendance, I have had the pleasure of heartily thanking them for their co-operation.'

'How are the Elementary School Scholarships provided?'

'By subscriptions given by gentlemen in Manchester, and by the profits of the Annual School Concert. The amount thus raised is supplemented by special grants from the Science and Art Department. Our last concert, given in December, 1890, at the Free Trade Hall, realised a profit of £110, which was sufficient to secure 22 scholarships. Since 1882 we have raised by our concerts more than £500, and this, with the Government subsidies, has provided scholarships of the value of £1,250.'

'It would be interesting to know something of the nature of your concerts, which prove so productive.'

'Well, here is a programme of the last:—

BOYS' CLUB DRILL.

1. CHORUS 'Hymn of the Fisherman's Children' From '*Zampa.*'
2. CHORUS OF GIRLS 'Roses Red and Roses White' *Sullivan.*
3. SOLO - 'Two there are for whom in duty' - *Sullivan.*
4. SOLO AND CHORUS 'For the merriest fellows are we' *Sullivan.*
5. SOLO AND CHORUS 'Thank you, gallant gondolieri' *Sullivan.*
6. RECITATION.
7. CHORUS - 'Pretty Village Maiden' - - *Gounod.*
8. QUARTETTE 'His Grace's own particular drum' *Sullivan.*
9. SOLO - - 'Duke of Plaza Toro' - - *Sullivan.*
10. SOLO AND CHORUS 'No possible doubt whatever' *Sullivan.*
11. SOLO - 'When a merry maiden marries' - *Sullivan.*
12. SOLO AND CHORUS 'Regular Royal Queen' - *Sullivan.*

INTERVAL.

GIRLS' DRILL.

13. CHORUS - - 'Friendship' - - - *Donizetti.*
14. RECITATION 'Le Meunier et le Charbonnier' *Mons. Chevalier.*
15. CHORUS OF BOYS 'Venetian Song' - - *Paolo Tosti.*
16. SOLO - 'The Song that reached my heart' *Julian Jordan.*
17. SOLOS WITH CHORUS 'They all shall equal be' - *Sullivan.*
18. SONG AND CHORUS 'There lived a King' - - *Sullivan.*
19. SONG AND CHORUS 'Skye boat song' - (*Jacobite Song.*)
20. RECITATION.
21. CHORUS - - 'Home Love' - - - - *Löhr.*
22. CHORUS OF BOYS 'Maiden, tell me, I pray' - *Gounod.*
23. CHORUS - 'Behold, how brightly!' - - - *Auber.*

GIRLS' DRILL.

GOD SAVE THE QUEEN.

You will see that we have a good many pieces from Gilbert and Sullivan's comic opera 'The Gondoliers.' For several years we have adopted a similar plan, selecting at one time from 'The Mikado,' at another from 'Pinafore,' at another from 'The Yeomen of the Guard.' Our experience has been that these selections have been very popular both with the scholars and the public. I must admit, too, that I have a strong personal liking for such music; in fact I never tire of it.'

'But how do you overcome the difficulty of Sullivan's music being protected?'

'Oh, we negotiated with Mr. D'Oyly Carte, and he has treated us very liberally. On payment of a guinea, he allowed us to use any music we thought suitable, provided it was rendered without action, and without stage costume. The guinea he was good enough to return as a contribution to our scholarship fund. On the last occasion we paid him two guineas, and this secured permission to use appropriate action for the songs, but not stage costume.'

'On what plan is your singing taught?'

'The Tonic Sol-fa System. That is one of the things for which I am truly thankful. It proved the key that opened the kingdom of music for me years ago, and I hope that, through me, it has been the means of opening it to most of my pupils. I remember when first I got hold of the system, it came upon me as a revelation similar to that when there first dawned upon me a clear apprehension of the roundness of the earth, and its movements in space. I honour the memory of John Curwen, for without his simple and well constructed system I should never have been likely to obtain any mastery of music, such as is necessary to give confidence in teaching it, and certainly I could not have ventured on conducting our school choir at a concert in the Free Trade Hall.'

'From your statement as to your continuous connection with the school it would appear that you were not trained at a training college. What is your opinion on the training of teachers?'

'Well, I have had much experience of teachers trained and untrained. I have known many good teachers, some excellent, who were without college training. But I do not in the least undervalue such training. If it were of the proper kind it would not make the work of the good ones less effective; but would be likely to make it more so. It would certainly tend to make some persons better teachers than they could possibly be without it. Training, however, must not be separated from practice. It cannot be acquired through books, nor by lectures. I have always considered higher education as desirable and in fact necessary for teachers, and so far as I could I have acted in accordance with this opinion. I would not like it to be thought that because I did not go through a training college course, I had not availed myself of some effective substitute. For several years, both while preparing for my certificate examination and afterwards, I attended the evening classes at Owen's College, where I had the advantage of studying mathematics under Professor Sandeman, classics under Professor Greenwood, chemistry under Professor, now Sir Henry, Roscoe. I also studied conic sections under Professor Barker, and political economy under the late Professor Jevons. As one result I gained the Cobden prize for the latter subject; and to the advantages I thus enjoyed I further attribute in great measure the considerable success which attended my teaching of mathematics and other subjects in Government Science Classes.'

'You have taken some active part, we believe, in public action on behalf of your profession?'

'Yes; I have always been a strong supporter of the National Union of Teachers, and have been ready to help in any movement favourable to the interests of the profession. For some years I was a member of the Executive Committee, but felt at last obliged to retire on account of the serious demands frequent journeys to London made upon my time. Still I work just as heartily in my own neighbourhood for the cause of union amongst teachers. During the sitting of the Royal Commission on Education I was called as a witness, and gave evidence in favour of a more rational basis for the Government Code. At present I have the honour of being Vice-President of the Manchester Branch of the Teachers' Guild, and there I strive to advance the general cause of education on the same lines.'

'Well, we have been deeply interested in the particulars you have given us, and we are sincerely grateful for the kindness you have shown in so readily answering our inquiries. We trust an account of your work will not merely interest others, but bear fruit by encouraging others to imitate and emulate your example.'

As we bade good bye to our friend we could not but reflect on what we had seen and heard. And prominent among our thoughts was the conviction that it would be well if schools like the Manchester Central School were established in every large town in the country, and if men similar to Mr. Scotson could be found to direct the work in them. For though much is due to the enterprising spirit of the Manchester School Board, and the endeavour on their part to keep abreast of the educational needs and capabilities of the times, the secret of success in their school lies chiefly in the continuous dominating influence of one man, clear of sight, strong of will, tender of heart, and with a mind alive and responsive to every wave of progress in the sphere of national education; and that one man is the one whom Mr. Mundella, another enthusiast in the same cause, designated at the opening of the school 'the Prince of Schoolmasters.' Long may his influence continue!

The subject of our next sketch will be MRS. BURGWIN, of the Orange Street Board Schools, Southwark.

CENTRAL ORGANISED SCIENCE SCHOOL, MANCHESTER.

SECOND YEAR'S COURSE.

CLASS A.

	MORNING.			AFTERNOON.			
MONDAY	Scripture	French	Mathematics	P. P. & S. Geometry	Machine Drawing		
TUESDAY	Scripture	Composition	Mathematics	Sound	French		
WEDNESDAY	Scripture	Practical Chemistry	Theoretical Chem.	Drawing	Drawing		
THURSDAY	Scripture	Mathematics	Mechanics	Commercial	Commercial		
FRIDAY	Scripture	Mathematics	Theoretical Chem.	Physiology	French		

SCHEDULE OF SUBJECTS AND HOURS.

Mathematics	5½	Sound, &c., or Magnetism...	1½
Practical & Theo. Chemistry	4	French	2½
Mach. Drawing & Geometry	2½	Freehand Drawing	2½
Commercial Work	2½	Composition	1
Theoretical Mechanics	1½	Science Preparation	0
Physiology	1½		
		Total	24½

CLASS B.

MONDAY	Scripture	Practical Chemistry	Sound	French	Mathematics	Science Preparation	
TUESDAY	Scripture	Mathematics	French	P. P. & S. Geometry	Machine Drawing		
WEDNESDAY	Scripture	Physiology	Theoretical Chem.	Drawing	Drawing		
THURSDAY	Scripture	Commercial	Commercial	Mathematics	French	Science Preparation	
FRIDAY	Scripture	Mechanics	Theoretical Chem.	Mathematics	Composition	Science Preparation	

Mathematics	4½	Physiology	1
Theo. & Practical Chemistry	4	Sound, &c., or Magnetism...	1½
Mach. Drawing & Geometry	2½	French	3
Freehand Drawing	2½	Composition	1
Commercial Work	2½	Science Preparation	1½
Theoretical Mechanics	1½		
		Total	24½

CLASS C.

MONDAY	Scripture	Mathematics	Sound	Drawing	Drawing		
TUESDAY	Scripture	Mathematics	Composition	Theoret. Mechanics	French	Science Preparation	
WEDNESDAY	Scripture	P. P. & S. Geometry	Machine Drawing	Commercial	Commercial		
THURSDAY	Scripture	Practical Chemistry	Theoretical Chem.	Mathematics	French	Science Preparation	
FRIDAY	Scripture	Mathematics	Physiology	Mathematics	French	Science Preparation	

Mathematics	5	Physiology	1½
Theo. & Practical Chemistry	2½	Sound, &c., or Magnetism...	1½
Mach. Drawing & Geometry	2½	French	3
Freehand Drawing	2½	Composition	1
Commercial Work	2½	Science Preparation	1½
Theoretical Mechanics	1½		
		Total	24½

FIRST YEAR'S COURSE.

CLASS D.

MONDAY	Scripture	Mathematics	French	Drawing	Drawing		
TUESDAY	Scripture	Practical Chemistry	Magnetism	French	Mathematics	Science Preparation	
WEDNESDAY	Scripture	Mathematics	French	Composition	Mathematics	Science Preparation	
THURSDAY	Scripture	Mathematics	Theoretical Chem.	P. P. & S. Geometry	Machine Drawing		
FRIDAY	Scripture	Composition	Mathematics	Commercial	Commercial		

Mathematics	6	Sound, &c., or Magnetism...	1½
Theo. & Practical Chemistry	2½	French	3½
Mach. Drawing & Geometry	2½	Composition	1
Freehand Drawing	2½	Science Preparation	2½
Commercial Work	2½		
		Total	24½

CLASS E.

MONDAY	Scripture	P. P. & S. Geometry	Machine Drawing	Mathematics	French	Science Preparation	
TUESDAY	Scripture	French	Magnetism	Mathematics	Composition	Science Preparation	
WEDNESDAY	Scripture	Mathematics	French	Mathematics	Science Preparation		
THURSDAY	Scripture	French	Mathematics	Practical Chemistry	Theoretical Chem.		
FRIDAY	Scripture	Commercial	Commercial	Drawing	Drawing		

Mathematics	6	Sound, &c., or Magnetism...	1½
Theo. & Practical Chemistry	2½	French	4
Mach. Drawing & Geometry	2½	Composition	1
Freehand Drawing	2½	Science Preparation	2½
Commercial Work	2½		
		Total	24½

CLASS F.

MONDAY	Scripture	French	Mathematics	Practical Chemistry	Magnetism		
TUESDAY	Scripture	Mathematics	French	Mathematics	Science Preparation		
WEDNESDAY	Scripture	Commercial	Commercial	Mathematics	French	Science Preparation	
THURSDAY	Scripture	Composition	Mathematics	French	Theoretical Chem.		
FRIDAY	Scripture	P. P. & S. Geometry	Machine Drawing	Drawing	Drawing		

Mathematics	6	Sound, &c., or Magnetism...	1
Theo. & Practical Chemistry	2½	French	4½
Mach. Drawing & Geometry	2½	Composition	1
Freehand	2½	Science Preparation	2½
Commercial Work	2½		
		Total	24½

CLASS G.

MONDAY	Scripture	Mathematics	French	Composition	Physiography		
TUESDAY	Scripture	Commercial	Commercial	Drawing	Drawing		
WEDNESDAY	Scripture	French	Mathematics	Science Preparation	Theoretical Chem.		
THURSDAY	Scripture	Physiography	French	Mathematics	French	Science Preparation	
FRIDAY	Scripture	Practical Chemistry	Mathematics	P. P. & S. Geometry	Machine Drawing		

Mathematics	5	Sound, &c., or Magnetism...	0
Theo. & Practical Chemistry	2½	French	4
Mach. Drawing & Geometry	2½	Composition	1
Freehand	2½	Science Preparation	2½
Commercial Work	2½	Physiography	2½
		Total	24½

CLASS H.

MONDAY	Scripture	Commercial	Commercial	Mathematics	French	Science Preparation	
TUESDAY	Scripture	P. P. & S. Geometry	Machine Drawing	Drawing	Drawing		
WEDNESDAY	Scripture	Mathematics	French	Practical Chemistry	Theoretical Chem.		
THURSDAY	Scripture	French	Physiography	Mathematics	Science Preparation		
FRIDAY	Scripture	Physiography	Composition	Mathematics	French	Science Preparation	

Mathematics	5	Physiography	2½
Practical & Theo. Chemistry	2½	French	4
Mach. Drawing & Geometry	2½	Composition	1
Freehand	2½	Science Preparation	2½
Commercial Work	2½		
		Total	24½

NOTE.—Mathematics includes Algebra, Arithmetic, & Euclid for Stage I.; also for Stage II. includes Trigonometry. Commercial Work includes Book-keeping, Tots, Commercial Arithmetic, Précis Writing, & Shorthand.

THE 1891 SCHOLARSHIP EXAMINATION.

BY DR. GEORGE BEACH, M.A.

Co-Author of 'A Manual of our Mother Tongue.' — Author of 'Elements of English,' 'Entertaining Readers,' etc.

WE had hoped, and it formed part of our plan, to have presented our pupils with a complete series of examination papers on exactly the same lines as the Government ones, but the Fates have ruled it otherwise and mortals must submit.

Time, however, still remains for us to proffer advice and assistance as regards the examination itself, and the time immediately preceding it.

We have no comfort to give to the non-industrious, but much for the timid or nervous hard-worker; for whilst the 'Scholarship' cannot be passed without steady plodding work, yet at the same time it is an easy examination, and should bring no terrors to the candidate of ordinary ability and average industry.

For at least a week before the ordeal very little reading should be indulged in, but much, though not fatiguing, out-door exercise should be taken, the object being to bring the body up to the perfection of health, and to rest the mind until it attains the greatest possible vigour, coolness, and perception.

Above all things CRAMMING MUST BE STOPPED. If the work be not now mastered, it is too late, and even the poorly-equipped candidate will do well to recognise this fact.

The writer knows an eminent scientist who failed most ignominiously at his examination for the Doctorship of Science, simply because he had allowed himself no preceding restful interval. His jaded mind refused to answer to the spur, and disaster was the result, although in the ensuing week, without any further preparation, he was complete lord of the questions.

When starting for the examination centre, the student must be careful to take with him all the data respecting his successes for which he is claiming extra marks.

He may not have heard of his results at the recent May examinations, but still he must take with him particulars of his candidatures at that time.

It is not necessary to mention that absolute integrity and correctness in his returns is essential, and that any wilful mis-statements or culpable carelessness will lead to Departmental ostracism either perpetual or for a period.

We should not mention this but for some immoral boasts respecting alleged successful deception which our correspondents have forwarded to us.

On this occasion it is not certain whether the questions and answers will be on one paper as formerly, or whether, imitating the example set at the last Christmas Certificate Examinations, the questions will be printed on separate slips, whilst the answers are to be entered in MS. books.

Let the examinee take with him small-hand, large-hand and map pens, black and red ink, blue, black and red pencils, penknife and india-rubber.

Arrived at the room, the printed notice issued to the candidates should be carefully perused, and any necessary particulars filled up before the questions are even glanced at. Every year several candidates fail through not 'heading their papers.' Besides positive directions, there are often recommendations given, and these, too, should be implicitly followed.

DON'T

deal in generalities, or random shots, or spend too much time on one question. DON'T sanction the slightest breach of rules, write very small or between the lines, despise easy questions, omit maps and diagrams ave the examination room too early.

DO

coolly ascertain the meaning of the question, plan out your answer, decide whether a tabulated or extended answer is best, revise each question as soon as finished, check your answers by a fresh method, and take care to work the Euclid deductions (*Males*).

Now in parting company we wish to all our pupils 'God speed.'

THE 1892 SCHOLARSHIP EXAMINATION.

Le roi est mort; vive le roi! One Scholarship course is departed; the next now commences, wherein we solicit from our new readers the same indulgence as was conceded to us by our old friends.

A full twelve months lies before us, and in this time much may be accomplished by those who will take time by the forelock by means of steady, continuous and judicious application rather than by bursts of intermittent, unstable and ill-applied energy.

One of the first points to be attended to is 'TEXT BOOKS.' The most skilled workman can do comparatively little with rude tools, and the most earnest student will be deficient in attainments if his manuals of instruction be inferior.

The importance of this matter has been dealt with in the Pupil Teacher Course, and the same volumes there recommended can be safely praised here.

The primary step for the Scholarship candidate is to apply at once for admission into some training college. So great at present is the press of competition that no delay must take place. If the achievement of a high position in the first class is not a moral certainty, then any idea of a metropolitan college should be abandoned, and negotiations be entered into with any provincial college upon which the student may have claims.

The college having been decided upon, the school correspondent should apply for the requisite particulars and forms, and the latter should be duly filled in and despatched without delay.

The next consideration should be how to secure the marks given for the *optional* subjects—Drawing, Science, Language, and Music.

DRAWING.—Pupil teachers who during their engagement successfully work papers in Freehand, Geometry, Perspective and Model Drawing are credited with marks both in the Scholarship and Certificate examinations.

SCIENCE.—Marks will also be given to any Scholarship candidate who at one of the examinations held in May of each year by the Department of Science and Art has taken a first class in the elementary stage, or passed in the advanced stage of ONE of the following subjects:—(1) Mechanics; (2) Chemistry; (3) Animal Physiology; (4) Acoustics, Light and Heat; (5) Magnetism and Electricity; (6) Physiography; (7) Botany; (8) Principles of Agriculture.

Physiography is the science most strongly to be recommended on account of the material help it will afford the candidate in his geographical studies.

LANGUAGE.—A paper will be set in—(1) Latin, (2) Greek, (3) French, and (4) German.

Very few take Greek or German, but a considerable number take Latin, and a great many French.

MUSIC.—The examination will be a practical one on *Time* and *Tune*.

Time will consist in sol-faing or reading without musical intonation a unison passage of one or more measures in time; *or* giving the time names of such measures recited by the examiner.

Tune will comprise sounding single notes, or passages of two or more notes, in a given scale from dictation; *or* naming such note sounded by the examiner.

There may thus be *ear-tests* both in Time and Tune.

All candidates who have been pupil teachers will have marks awarded for their skill in Teaching, and a paper on Domestic Economy will also be set to puzzle the ladies.

In connection with these articles will appear a Monthly Syllabus of Work, a series of Government questions selected as bearing thereupon, and remarks upon the salient points. In our advertising columns will also be found information as to classes worked in connection with these articles; and in these days of competition it is without question that the pupil teacher domestically or locally trained cannot hold his own with one who has had the benefit of the experience of a 'COACH' possessing all the '*Tips*' at his fingers' ends, and knowing all the '*dodges* and *grooves*.'

Next month the first Routine will appear, and we trust that a considerable number will have given in their names as correspondence pupils.

Special assistance is all the more necessary now that only two chances of passing are allowed.

CORRESPONDENCE.

W. J. (Castleton).—You are quite safe.

RHYS (Cardiff).—See our present issue, where you will find full information.

J. M. (Durham).—Moffatt and Paige's 'Solution of Difficulties in Arithmetic'; Blanchard's Notabilia of History and Geography, published by Thomas Murby.

SAM (Runcorn).—It is quite out of the question.

J. M. (Digby Marsh).—You may extend your engagement.

LEWIS PROVIDENCE—From 90 to 95 per cent. None of the *d*'s have the downstroke long enough, and the initial curve of the large-hand *U* is poor.

A. R. (Tamworth), H. S. C. (Weymouth), F. R. (Whitby), F. D. (Todenham), ANXIOUS (Belfast), answered per ordinary letter.

(To be continued.)

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PUPIL TEACHERS' COURSE.

EVERY head teacher and pupil-teacher knows that it is the duty of the one to impart and the privilege of the other to receive such technical and general instruction as will qualify the apprentice to achieve professional and examinational success.

Quite as well, too, it is known on both sides, how onerous the burden is of teaching but a few, and how numerous and formidable are the obstacles which almost prohibit systematic instruction and training.

These things are so much a matter of notoriety that in large towns centres for the instruction of pupil-teachers have been formed, and everywhere the Education Department has advocated that there should be a co-operation and division of labour.

It will be our part to assist in carrying out this wise recommendation, and we shall endeavour to save the brain, time, and patience of the head teacher, and to systematise the study of the pupil-teacher, by the schemes set forth in our columns.

All pupil teachers ought to cover a portion of three subjects every day, and his whole course in fourteen weeks or thereabouts. Then by going over the course (with variations) three times, the subjects ought to be well-mastered, and ample time would be left for holidays and final private study.

In the first half of the apprenticeship the time devoted daily to each of the three subjects need not exceed forty minutes. Thus the total would be two hours study per diem. During the latter half of the four year's course, the lessons should be each an hour long, giving a total of three hours per day. Less time than this will not suffice, and longer will not be utilised. One hour should certainly be before morning school and two hours be in the evening.

In weighing over and deliberating upon these statistics, it has been assumed that the pupil teacher before entering upon his apprenticeship has CREDITABLY passed at least the Sixth Standard. If he has not done so, he has no business to be a teacher. In connection with this point we shall not forget that many girls are not taught Geography, and that some girls' schools are so ill-advised as even to dispense with Geographical Readers.

Moreover, we know full well that every Scholarship candidate must have, in order to take a good position, in his first and second years of apprenticeship, conquered much more than the minimum work exacted from him, and must have obtained the additional marks given for Drawing and Science, besides having attained to a considerable degree of musical science and musical vocal and instrumental skill.

Further, any Routine that is too rigid will not be followed. There must be times allowed for revision, for overtaking of unavoidable arrears, for the study of the extras, and for general reading.

But, nevertheless, we will lay it down as a general rule that a male pupil teacher should pass in Second Grade Mathematics as early as possible, should then take an Advanced Science, and should each year from the very beginning attempt to pass in two of the Drawing Subjects, until all be fulfilled. Neither should a Language (say Latin or French) be forgotten, but while the memory is fresh and retentive the Accidence of the chosen language should be mastered, and then the scholarship linguistic standard can easily be attained.

Two great practical difficulties stare us for the present in the face:—

(*a*) We are only three months off the October Examination.

(*b*) All pupil-teachers are not examined coincidently, but some in April and others in October.

The former difficulty must for this year be faced by simply making our Routines for the October teachers recapitulatory or revisional; the latter will be overcome by judicious arrangements.

We have not hitherto spoken of the great disadvantages which some pupil-teachers labour under, through lack of sufficient and efficient text-books. Cases are frequent where they are attempted to be put through their examinations, having only studied one book—*A Pupil-Teacher's Course*. This is a gross abuse of manuals which may be very valuable in their right place—namely, as guides in selecting what shall be revised during the concluding weeks of private study immediately precedent to the Examination.

EFFICIENT Text Books! What a number of ancient treatises are still popular—works which neither in extent or character meet examinational demands—works whose only claim to respect is a venerable and historic one, as links in the chain of the evolution of suitable manuals!

MONTHLY ROUTINE FOR PUPIL-TEACHERS OF THE FIRST THREE YEARS.

1. The Fourth Year will be dealt with in the Scholarship Article.

2. In subjects like Arithmetic, where the requirements for boys and girls differ, the lower half of the rectangle is devoted to the latter.

3. The compiler of the Routines has had the assistance furnished by Routines used at several pupil-teacher's centres, and in the main, the time required, and its distribution among the various subjects, agrees with his ideas.

PUPIL TEACHER'S ROUTINE FOR JULY.

DAYS	YEARS	FIRST WEEK			SECOND WEEK			THIRD WEEK			FOURTH WEEK		
		I.	II.	III.	I.	II.	III.	I.	II.	III.	I.	II.	III.
Monday	1	Analysis and Parsing	Measures and Multiples	Drawing	Analysis and Parsing	Common Denominators and Lowest Terms.	Drawing	Analysis and Parsing	Subtraction of Vulgar Fractions	Drawing, Algebra, or Sewing	Composition or Paraphrasing	Revision of Vulgar Fractions	Drawing, Algebra, or Sewing
	2		Theory of Proportion. Multip. of Vulgar Fractions			Simple Proportion. Multiplication of Vulgar Fractions			Compound Proportion. Complex Fractions			Method of Unity. Vulgar Fractions of Money	
	3		Square Root. Addition and Subt. of Decimals			Mensuration of Rect. Mult. and Div. of Decimals			Present Worth. Reduction of Dec. Frac. to Vulgar			Stocks. Short Methods with Repeaters	
Tuesday	1	½ of Euclid's Defini. Book I. Garment with req. stitches	Geography of England	Science	All of Euclid's Def. Book I. Garment with req. stitches	Geography of England	Science	Post. & Ax. of Euc. Book I. Garment with req. stitches	Geography of England	Science	Euclid, Book I., Prop. 1. Stocking-hole mending	Any Geography	Science
	2	½ of Euclid's Def. Book I. Garment with req. stitches	Geography of Europe		Post. & Ax. of Euc. Book I. Garment with req. stitches	Geography of Europe		Props. 1 & 2, Euclid Book I. Garment with req. stitches	Geography of Europe		Euclid, Book I., Props. 3 and 4. Calico Patch	Longitude	
	3	Revise first 13 Props. Garment with req. stitches	Geography of Asia		Props. 27, 28, Euclid Book I. Garment with req. stitches	Geography of Asia		Props. 29, 30, Euclid Book I. Garment with req. stitches	Geography of Asia		Euclid, Book I., Props. 31 and 32. Hedge-tear Darn	Winds	
Wednesday	1	French or Latin	History from 55 B.C. to 78 A.D.	Simple Practice	French or Latin	Dates from 55 B.C. to 121 A.D.	English from Text Book	French or Latin	History from 410 to 787 A.D.	English from Text Book	French or Latin	History from 787 to 901 A.D.	Compound Practice
	2		History from 1066 to 1087 A.D.	Mixtures. The different kinds of Vul. Fractions		Dates from 1066 to 1106 A.D.			History from 1153 to 1189 A.D.			History from 1189 to 1216 A.D.	Div. into Proportional Pts. Proofs of Vul. Frac. Rules
	3		History from 1485 to 1510 A.D.	Square Root. Multiplication of Decimals		Dates from 1485 to 1535 A.D.			History from 1553 to 1572 A.D.			History from 1572 to 1602 A.D.	Stocks. Money Decimals
Thursday	1	How to teach Reading	Introductory Algebra. Garment with required stitches	History from 78 to 121 A.D.	How to teach Writing	Addition of Algebra. Garment with required stitches	History from 121 to 410 A.D.	How to teach Arithmetic	Addition of Algebra. Garment with req. stitches	Dates from 121 to 410 A.D.	How to teach Spelling	Subtraction of Algebra. Paper Patterns of Garments	Revise History
	2			History from 1087 to 1106 A.D.			History from 1106 to 1153 A.D.		Subtraction of Algebra. Garment with req. stitches	Dates from 1106 to 1189 A.D.			History from 1216 to 1270 A.D.
	3	How to teach Geography		History from 1510 to 1535 A.D.	How to teach Grammar	Subtraction of Algebra. Garment with req. stitches	History from 1535 to 1553 A.D.	How to teach Composition	Multiplication of Algebra. Garment with req. stitches	Dates from 1535 to 1572 A.D.	How to teach History	Div. of Algebra. Paper Patterns of Garments	History from 1602 to 1624 A.D.
Friday	1	Composition or Paraphrasing	Measures and Multiples	½ of Euclid's Def. Garment with required stitches	Composition or Paraphrasing	Addition of Vulgar Fractions	Geography of British North America	Prefixes, Roots, or Affixes	Problems involving Add. and Subt. of Vulgar Fractions	Geography of British North America	Prefixes, Roots, or Affixes	Simple Practice	Geography of British North America
	2		Simple Proportion. Division of Vulgar Fractions	All Euclid's Def. Book I. Garment with req. stitches		Compound Proportion. Division of Vulgar Fractions	Geography of India		Method of Unity. Vulgar Fractions of Money	Geography of India		Revise Theory of Ratio & Proportion Any Abs. Vul. Fr.	Geography of Europe
	3		Mensuration of Squares. Division of Decimals	Revise first 26 Props. Garment with req. stitches		Equation of Payments. Reduc. of Vul. Frac. to Dec.	Geography of Africa		Discount. Theory of Repeating Decimals	Geography of Africa		Stocks. Money Decimals	Geography of Africa
Saturday	1	Physical Map of England	Introductory Algebra. Garment with req. stitches	Music	Political Map of England	Any Lesson	Music	Physical Geography of Mountains	Anglo-Saxon Literature	Music	Physical Geography of Mountains	Any Lesson	Music
	2	Map of France	Addition of Algebra. Garment with required stitches	Literature Repetition Writing	Map of France		Literature Repetition Writing	Longitude	Literature of the Norman Period	Literature Repetition Writing	Latitude		Literature Repetition Writing
	3	Map of India			Map of India			Winds	Literature of the Tudor Period		Ocean Currents		

To the above routine some may object, on the intelligible grounds that the year's course cannot be effectively covered in three months. Neither do we at all aver that such an accomplishment is possible to ordinary pupil-teachers. But an extended and lengthy experience has shewn us that it is best to cover the whole ground of the syllabus, even if somewhat imperfectly, and then ample time will be given in nine months for revision and re-revision.

Besides, just as in every good school the scholars *before* passing out of one standard have already done a considerable portion of the work of the next highest standard, so the requirements of the Junior P. T. years are so meagre, that the Standard VI. scholar has done much towards them. This enables the P. T. of each year to attack the work of the next year a long way in advance.

Moreover, if any accident happen or impediment present itself to the student, he has actually covered the whole course, and stands a better chance of passing his examination than if only one quarter of the work had been thoroughly done.

There is, too, an additional reason. By the plan adopted, pupil-teachers whose examination takes place in October, and those examined in November, can work coincidently.

It is earnestly requested (as aforesaid) that all pupil-teachers will endeavour to prepare science, language, music, and drawing, beginning from the commencement of their apprenticeship, in order that they will be able to score the extra scholarship marks. These things cannot be crammed in just at the last.

The following books are strongly recommended:—

Dunstan's Music Manual.
Gladman's School Management, Bailey's 'How to Teach the Babies,' Heller's Code.
Boyd Carpenter's British History.
Sanderson's or Ross's History (larger edition), Curtis' Date Book.
Gregory's Physiography, Brook's Text Book of Geography for Pupil Teachers, Philips' Student's Atlas.
Dixon and Beach's Arithmetic, Pendlebury's Arithmetic.
Todhunter's Mensuration.
Deighton's Euclid, Egan's Deductions, Part I.
Hamblin Smith's, Charles Smith's, or Hall and Knight's Algebra.
Dr. Beach's 'Elements of English,' Dawson's Paraphrasing.
Professor Darqué's French Course, Huxley's Scholarship Latin.
Hughes's Art of Handwriting.
Halford-Hawkins's Art of Reading and Reciting.
Stormonth's Dictionary.

If we were quite sure that our readers were all working from the same text books, we could guide them from day to day, yea, even from lesson to lesson.

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DAPHNE'S DARING.

BY MRS. A. PHILLIPS.

Author of 'Man Proposes,' Benedicta,' 'By the Cards,' &c.

CHAPTER I.

'Sing heigh ho! and heigh ho!
Young girls must marry.'

CARTOWN was a provincial town of the slow, well-to-do type. It had no attractions that tempt the traveller to loiter in its streets. It was matter-of-fact and orderly; and anything out of the ordinary routine of life sent it for the moment into convulsions. It had its High Street and its Market Street; and the people knew each other from generation to generation.

One of the most respected families in Cartown was the Lees. Mr. Lee was the architect and land surveyor of the town. He had been born and bred, educated and married, in Cartown, and was now one of its representative men; as any one might see who took notice of his fine portly figure and satisfied countenance, as he walked down the High Street to his office, and exchanged nods and how-d'ye-do's with every one he met.

He was a prosperous man, and his family were settled around him. Next door, on either side, in a handsome row of semi-detached villas—called Albion Villas—of which he occupied Number 9—lived his two married daughters, Mrs. Gibbs and Mrs. Martin, who had married young men, each having some business in the town. James Lee the only son, and his father's partner, also recently married, still lived in a patriarchal fashion with the old people.

Mrs. Lee was quoted as a pattern amongst women by high and low in Cartown. Content with her position in life, convinced that under heaven the equals of her sons (for she had taken Gibbs and Martin to her bosom as sons) and daughters were not to be found, respected by the world and beloved by her children and friends, Mrs. Lee's existence might be compared to a prolonged purr of satisfaction. She was a handsome, motherly woman, stout and comfortable, with soft brown eyes and grey banded hair; a woman it did not take any one very long to feel at home with. Yet she had her prejudices, as will be seen, and could be severe when things went contrary to her idea of fitness.

Her family being settled about her in the patriarchal manner described, she felt she had had enough of marrying and giving in marriage. She had done her duty in this respect with care, foresight, and judgment that left nothing to be desired and nothing to regret. She could hold up her head among her neighbours and feel that her girls hadn't gone 'a-begging,' as she termed it. Having kept up the credit of her family, and maintained her position thus far, she had no anxiety on the question of matrimony any further. There was only Daphne left, and she being the youngest it was no matter of consequence if she never married at all.

In point of fact, it fell in with Mrs. Lee's idea of the fitness of things that there should be always a single woman in every family—one who, in herself, should pay the debt of care bestowed by the parents on their children, by, in turn, remaining to take care of them, when all the rest had departed. She settled it therefore that Daphne would not marry.

On the same principle that she was proud and glad to let the world see in the marriages of her two elder girls that a child of hers need never want for a husband, so now was she glad to show this same almighty world that she could afford to keep her girls, and had no need to marry them off out of her house in a hurry, as if there was never a sixpence to keep them, even to old age if necessary.

So she grew from hoping into deciding that Daphne was to stay at home and be the comfort of their declining years.

'Besides, it was so pleasant to have a young girl in the house,' she thought. She should feel lost without one. A girl gave such numerous pretexts for entertainments and outings that she, grandmother though she now was, by no means felt herself too old to enjoy.

She was jealous, therefore, over Daphne, her youngest girl and her darling.

On the question of entertainments and outings, Mr. Lee would tell her that it was high time for her to leave off all such vanities; for his part he saw no good in them.

'Of course not,' she would retort. 'You men are all alike. King Solomons all over! After making yourselves sick of pleasure, you make a merit of discovering its unwholesomeness!'

But the good soul was as young in heart at fifty-six as at sixteen. Not that she was ever to be seen frisking about in the same quadrille with her daughters. But she was proud of her girls; and as she marshalled them into a ball-room she grew young in their youth, and entered into their enjoyments with as much zest as though she were the chief one concerned.

But that is a nice, sweet way some mothers have.

Still, this maternal unselfishness notwithstanding, she certainly did want to keep Daphne. The consequence was that she never smiled kindly on any man that showed her ominous attention. She was glad that the girl should enjoy herself.

Oh dear, yes!' but only so long as it meant 'proper' girlish enjoyment, and contained none of that 'foolish' element known among elders as 'falling in love.'

Unfortunately, Mrs. Lee reckoned without her host. This country romance of every-day life would never have seen the light had Daphne only fallen in with her mother's views. But this she did not do.

The early marriages of her two sisters—at the respective ages of seventeen and eighteen—had given her an idea that these were the canonical years for matrimony, to pass which one's chance was poor indeed.

And she was now nineteen!

Already she saw herself an old maid. She was very simple, and she made sure there was something wrong somewhere, for here she was at nineteen, and she had never had a lover! She felt dreadfully old. She did not know the secret of her sensations arose from the fact that, as Victor Hugo tells us, twenty is the old age of childhood, and that on reaching twenty-one we grow young again until we reach forty, which is the old age of youth.

It was a decided fact—this sense of creeping age—that at nineteen Daphne felt old and neglected, since nobody cared for her, at least not as she wanted to be cared for. Then her mind would take a forward glance towards the dim horizon of twenty-five, wondering what she should do if that first instalment towards old age should find her still forlorn!

It was all very well for her mother to shake her head and look serious when the possibility of her marrying was ever hinted at. Mrs. Lee would never allow it to go beyond a 'hint,' smothering the suggestion with a remark of which her daughters, Mesdames Gibbs and Martin, were a contradiction.

'Why put such nonsense into the girl's head? It was most unbecoming for young people to think of marriage!'

With such inconsistencies on her mother's part, striving to stifle her own natural feelings, Daphne's mind was thrown back upon itself, and she was for ever dwelling upon the subject of the possible hero who should come to claim her unoccupied affections. She was a pretty, lady-like girl, with a warm, generous heart, and a mind capable of a good deal if she should be lucky enough to fall into good hands. She was quite sure that she would infinitely prefer a man who could express a fine sentiment to one who would compliment her pretty brown eyes and fair hair.

It wanted but a fortnight of her nineteenth birthday.

Her mother was happy, thinking, 'What a dear, good sensible girl Daphne was, not like other foolish things whose heads were always running on marriage.'

Her father, busy in his office, and taking his ease when out of it, never gave her an anxious thought at all. She was simply a matter of course in his life.

And she meanwhile sat wondering and wondering when *he*—the indefinite, idealised perfection of her dreams—would appear, and glorify her life, that, happy though she otherwise was in her home, would be imperfect without him.

CHAPTER II.

'When all the ruddy family around
Laugh at the jests or pranks that never fail.'

'I SAY, John, my dear, we must be thinking of giving a party.'

Mrs. Lee said this to her husband in a most motherly voice when the whole family, assembled, as usual in the drawing-room, were met together after the work of the day.

Mrs. Lee would have found no benefit in having settled her daughters to the right and left of her in Albion Villas if she could not have enjoyed this family gathering, which took place every evening at one of the three houses.

The servant had not yet brought in tea. Matilda (Mrs. Gibbs) and Jane (Mrs. Martin), together with pretty, prim Mrs. James, the last matrimonial addition, and Daphne, were all sitting in the back drawing-room, each employed on a piece of needlework. Mr. Lee was enjoying his paper in the easiest of chairs in the front room. At such a time 'Mother,' as Mrs. Lee was familiarly and universally called, was sitting not far off.

'Well, John, did you hear what I said?' remarked Mrs. Lee, seeing that her husband was turning a deaf ear to her proposition

But he had heard well enough, with misgivings of a most uncomfortable nature. If there was a thing he hated, it was to have his house and peace invaded in the manner proposed. He feigned deafness, but finding that useless, he replied testily,

'A party! What for? What on earth do you want with such nonsense? We are very happy as we are, without having Jack, Tom, and Harry into the house to kick up a dust.'

'But, my dear John,' pleads Mrs. Lee, 'we mustn't be selfish; must we, now? We must consider the children. Daphne's birthday is on the 15th of June. A fortnight hence I have promised her a treat. So now, my dear John, you will have plenty of time to get reconciled to the misery before you.'

'Women are a great nuisance,' growls Mr. Lee, with more candour than politeness. But, then, he was in the bosom of his family, where the British Philistine is allowed the free use of his tongue, or takes it if not allowed. While avowing his opinion of the opposite sex, he knew that there was no resisting fate. Women—*his* women at least—always got their way. Still, he was not going to give in tamely without a protest. So he reiterated his opinion, 'Women are a great nuisance.'

'John, my dear! I am ashamed of you. A husband and a father so blessed as you have been, to speak so disrespectfully of *the* sex!'

'Yes, ma'rm,' he continued spitefully, marking his displeasure by substituting the formal 'Ma'rm' for mother.

'Yes, ma'rm, I mean what I say. You women are a nuisance, with your gowns and your parties, and your fal-lals. There is no end to it,' he growled, as he remembered only the expense that awaited him when the party had to be paid for.

He had worked hard for his money, and now hated to spend it. This not uncommon characteristic of the 'honest' man was the one little skeleton in Mrs. Lee's otherwise prosperous cupboard.

'John was so "near" in some things,' she would say, with a sigh.

He would bear the failure of an investment with the stoicism of a philosopher. He had endowed his children handsomely, and their expensive school bills had been met without demur. But the difficulty of extracting eighteenpence out of him over and above the sum he allotted for the different household expenses was not to be told. His resistance was always in an inverse ratio to the smallness of the sum demanded.

But Mrs. Lee generally carried her point. Not without some light skirmishing—still, carry it she did. Rising from her seat, she went into the back room, where the 'girls' were sitting. Turning to Daphne, she said—

'I have told your father that he must give you a party on your birthday.'

Daphne coloured with pleasure. It was something to look forward to.

Soon the nature of the party fell under discussion. Cartown was a provincial town. Provincial parties were not strictly fashionable affairs—not in Cartown, at least, which was too remote from the metropolis for anything like the 'latest fashion' in entertaining to have reached it.

The respectable, or as they loved best to call themselves, the 'genteel' townspeople of Cartown liked a little of all sorts at their parties. A little music and dancing in the drawing-room, and cards in a third room, which was generally

the best bedroom made into the card-room for the occasion, where the elderly people loved to have a quiet rubber and chuckle over their small gains.

They all knew beforehand the sort of affair it would be—what every one would wear—for there was seldom anything 'new' under the provincial sun of Cartown.

Daphne instantly bethought her of their staff of dancing men. Her heart sank when she remembered how poorly Cartown was supplied in this respect. Of old men and boys there was no lack; but of that piquant sauce for a party, known as an 'eligible,' there were but three or four at the most. She ran over their names in her mind, with the contempt bred by familiarity.

There was Mr. Potter, the rising young banker, and considered the 'catch' of the town. Dr. Phipps, the unmarried doctor. But he was always being 'sent for' just as he was embarking on the preliminaries of a flirtation. One or two others there were that Daphne might regard lightly, but whom it was second only to the triumph of winning a race to secure for a Cartown evening party.

After the gentlemen, the next serious consideration was the waiters. These functionaries in Cartown were the bootmaker and the greengrocer by day, and waiters by night. There were but two of them, and they were even more in request than the dancing men. Party-givers generally secured them before sending out their invitations.

Daphne left her mother to look after Dickenson and Jenkins, the waiters. Her mind was exercised about the dancing men. She determined to consult her brother.

'James, dear,' she asked, 'what are we to do for gentlemen? Can you get us any?'

'Ah, by the way, that reminds me,' he cried, turning to his mother instead of replying to Daphne, 'something so odd has happened to day.'

Instantly all faces wore a look of curiosity, while Mrs. Lee said—

'Indeed! What was it?'

'Well, I should never have recognised him, he is so altered. I met Grey, mother; he has come back. Don't you remember him—Grey that used to go to old Courtney's with me? His people lived in that house in the Abington Road. They were rather swells, you know; there is a title in the family—a baronetcy or something. Mrs. Grey died last year. You must remember.'

'Of course I do,' said Mrs. Lee. 'The daughters went to London to be married. Oh, yes; I remember. Mrs. Grey was high in her manners—inclined to be stuck up, which is a mistake now-a-days.'

'The same people,' said James. 'Well, I was in at King's, the tobacconist, this afternoon, after I left the office, and a fine, dashing-looking fellow came up to me and, putting out his hand, said, "Why, Lee, don't you remember me?"

'"I should think not," I answered, as I looked him in the face, which was half hidden by a beard.

'"Why, don't you remember your old chum, Oliphant Grey?" he asked.

'"Why, bless me you don't say so!" I exclaimed, as we shook hands.

'"To think that it is ten years since we met! You were only a fledgling then, and I not much better,' he remarked.

'"Ten years have made a greater change in you than me," I answered. "I defy man or mortal to have known you again with that beard."

'"My dear fellow, if you had been leading the wild sort of life I have been doing in Mexico you would have left yourself to nature and not troubled the barbers," he said, in his old bright way, which made me remember him again at once.

'"And what has brought you home?" I asked.

'"Fever in the first place, and to look after my poor mother's affairs in the second."'

'Poor young man,' echoed Mrs. Lee, as she listened to James's account of the interview. Her hard thoughts of Mrs. Grey melted when she remembered that she had left her son motherless.

'Dear me, yes, how dreadful! She died without ever having seen him again. That comes of young men gallivanting off to foreign lands. Their poor mothers have to die without a sight of them.'

Mrs. Lee gave a sigh of commiseration and relief combined, as she thought of her own death-bed, and how well attended it would be.

'He is a very nice fellow,' broke in James, who thought his mother was inclined to be lugubrious.

'Oh, mother,' exclaimed Daphne, whose mind was still running upon dancing men for her party, 'Oh, mother, do ask him to the party.'

'I think you are very premature, Daphne,' said prim Mrs. James, who felt confident, in the strength of recent matrimony, to decide upon all points of propriety. She threw a tone of reproof into her correction, as it was considered a duty by all the family to further Mrs. Lee's views, and to repress Daphne whenever she displayed any interest in the opposite sex.

'There is a great risk,' continued Mrs. James, 'in rushing into acquaintanceship with strangers at a moment's notice like this. After so many years of absence he is of course nothing more than a stranger.'

'Of course not,' echoes Mrs. Lee, while Mrs. James turns to the others to back up her opinion.

'Well Kate, you need not take me up so quickly,' returns Daphne, blushing and pouting. 'No one wants to marry Mr. Grey. I was only thinking of the party, and of getting as many dancing men as I could together.'

'I think we may venture so far,' says James, ever ready to pour oil on the troubled waters of his womankind. 'I dare say he will be very glad to come, for he complained of finding the place lonely—all his old friends gone. So make yourself happy, little woman,' he said, turning to Daphne, who was his favourite sister, 'I will ask Grey; but you must not forget Morris. You are going to invite him, are you not?'

'Yes,' says Daphne, with another blush.

Charley Morris had been forced upon her mind lately because more than once his mother, by various well-bestowed hints to her, had told her it was her one desire to see her Charley happily married, which Daphne interpreted, by the way in which it was said, that his mother wanted him to marry her.

Charles was a very good sort of fellow, but 'slow.' There is no need to define the word. When it is met with in humanity it makes itself felt; not as fever in the blood, but as a droop in the eyelids. He was good-looking enough; but Daphne always felt inclined to yawn at his approach, and a conversaton with him was an operation requiring as much skill as to get a Joke, according to Sydney Smith, into a Scotch mind.

The question of the party being settled, the invitations were issued, and answers now came dropping in. Among them came one from Mr. Grey. It was addressed to James, who had written to invite him in a friendly manner. After reading it he tossed it across the table to Daphne, with a smile, saying,

'It is all right for you, little woman; Grey can come.'

She took up the note quietly, and read it. Then, unobserved, she slipped it into her pocket. There was something in the handwriting that attracted her irresistibly. As soon as she reached her bedroom that night she laid it in her drawer together with her favourite souvenirs.

She could not tell why she did this. It was a presentiment, but an unconscious one.

CHAPTER III.

'Twas won, my Lord, by the first glance.'

THE fifteenth of the month arrived at last, as all pleasant and unpleasant things do arrive, by means of a little waiting.

As Daphne decided on the morning of her birthday to wear her white dress, trimmed with rosebuds, she hoped, without shaping her hope into actual words, that she might not wear it without success.

She had a strange vein of romance in her nature, and she hoped that if ever she did have a love affair it would not be so prosaic as those of her good sisters, Matilda and Jane. 'They might,' she thought, with a shrug of contempt, 'have been servants going into place,' so utterly matter of-fact had been the wooing and wedding in either case.

But, then, she knew quite well that she could never have married either 'Gibbs' or 'Martin,' as her brothers-in-law were familiarly called.

Charley Morris was rather on her mind, on his mother's account. She felt she had listened more than she ought to have done to Mrs. Morris's flatteries, and Charley bored her.

But there was no more time to think. She had given the last touches to the flowers. She had seen that everything was ready for their guests, and it was now time to dress.

Here was her father already, and about to make his official tour of inspection, and to see that the decanters were in full force and well filled.

Daphne looked charming when she was dressed. She was so happy. She had a delightful sense or presentiment that something was going to happen. She could not tell what, but this was to be no commonplace party for her.

On entering the parlour, as second rooms were still called in Cartown, where she had been told by her mother to remain to look after and pour out the tea, she found a very pretty bouquet awaiting her with Mr. Morris's compliments.

'Dear me, how very nice of him!'

Such little attentions pleased her. A succession of them might prove fatal!

But now there were some arrivals—so she waited to receive them.

They were Mrs. Morris and her son.

She thanked him for his flowers, and then dashed into conversation upon the barometer of the week. The only subject she had ever found Charley Morris eloquent upon was the weather. It might have been his love's eyes from the way he watched it, and talked of it—to young ladies, that is to say.

Presently, in a very loud voice, Dickenson, the waiter and quondam bootmaker, announced—

'Mr. Grey.'

The new arrival went up to James, who was sipping tea and talking to Mrs. Morris.

Daphne's heart beat a little faster when she saw the stranger whom James now presented to her.

She was self-conscious, remembering that she had put away his note in her drawer. This made her blush a little when she said 'How do you do?' and saw a tall, handsome man, with a brown beard, bending a pair of fine eyes pleasantly upon her.

Daphne needed no second glance to account for her presentiment. She knew something new was about to happen. Yes—surely here it was!

A few commonplace words, and then Daphne had to attend to other guests, and Mr. Grey talked to James. She could hear in the intervals of 'Will you take cream and sugar?' the words, 'Mexico and fever.'

It was no use trying to listen; so she went up and told James that their mother was waiting for them upstairs.

Very soon all the guests had arrived, and Daphne being then free to leave the tea to take care of itself, went upstairs. There was a hum of conversation as she entered the drawing-room. Matilda and Jane were sitting at the piano, about to begin a set of quadrilles to start the young people dancing, which reminded Daphne that she must get her friends some partners.

It was quite evident who was the hero of the evening, from the buzz and stir that went on among the young ladies when they saw Mr. Grey. He was just now standing under Mrs. Lee's maternal wing, having gone through a very satisfactory amount of catechising at her hands.

'Dear me, now, Mr. Grey, what on earth took you off to foreign lands? For my part I hate them. I am sure I don't know what Christian English mothers have to do to bring fine sons into the world only to send them abroad. I would never let one of mine go—not if I had six.'

'But how are they to live?'

'Live the same as they do out there, to be sure! Why should I send my son out to till American ground when he can quite as well till English?'

The question was one that needed the arena of a debating society, Mr. Grey felt; so he let Mrs. Lee have the last word.

Daphne now came up to him timidly,—for how could she do otherwise, remembering that note upstairs in her secret drawer,—and asked him, in her character of hostess, if he would join the quadrille then forming. If so, should she introduce him to a young lady; for quadrilles had not gone out in Cartown.

He bowed, and said, 'With pleasure.'

She took him at once to Effie Maitland, a young lady who demanded great attention from the social set at Cartown, and got it. She had such an unruly tongue, with the 'poison of asps' so well concealed beneath it, that Cartown society propitiated her. Daphne knew that if her party was to be a success, it was necessary she should extract the sting from their social scorpion, by introducing to her, before any one, the stranger of the evening.

It was impossible to leave her out of their social gatherings, for Effie Maitland was the family doctor's daughter, and therefore a social 'somebody' not to be ignored.

Mrs. Lee was always ready to take her part. 'Because, you see,' she would say in her motherly way, 'she has no mother, poor girl; and a father who is always at other people's bedsides, when he is not driving to see them, or mixing their physic, is as good as none at all to a girl like Effie.'

Effie was left, therefore, very much to the compassion of other mothers in Cartown—a compassion she by no means appreciated, but resented as an infringement of her position. She was wise in boarding-school conceit. She had graduated at a first-rate establishment in Brighton, where girls in their walks learnt the 'use of the eyes' as well as the use of the globes—and ended in being 'finished' specimens of some English girlhood, in whom there is any amount of guile.

Daphne felt bound to dance with Charley Morris, to reward him for his bouquet. They were *vis-à-vis* to Mr. Grey and Effie Maitland. Effie was making the most of her time as extempore showman of the natives to the stranger. She was a handsome girl of the bold, black-eyed, showy type, full of spirit and repartee. She amused where she tried to do so. Mr. Grey found himself very interested in her clever and satirical way of describing people and things. They were enjoying their dance, evidently, and had plenty to say to each other.

Daphne envied them. Not even the bouquet she held could atone for the flatness of Charley Morris's stupid remarks. She caught herself giving random answers, saying, 'Yes, it was a very wet day,' when the sun had been persistent.

In the second figure of the quadrille Daphne had to dance her *pas seul* to Mr. Grey, who, for the first time, remarked her seriously, wondering why he had not done so before. While advancing and retiring he was thinking—

'What charming eyes! How prettily she is dressed! What lovely hair! What a sweet little creature altogether!'

As soon as the figure was ended, he determined to cultivate her acquaintance.

Daphne was unconscious of the admiration she had inspired. She was far too shy to look into his face as she went through the figure, and felt quite relieved when it was ended.

When the quadrille was over, some one went through the operation of singing a song. It was 'a *little* music' in every sense of the word—a quivering, quavering effort on the part of some young lady to give the assembly present an idea of the last new ballad. Every one was thankful when the chorus of 'Thank you—what a charming song!' left the piano-stool vacant.

Daphne at once took it, and began to play a waltz. No sooner was she seated than Mr. Grey, who had been waiting his opportunity, came up to the piano, which had been drawn away from the wall for the occasion. Leaning his arm on the instrument and facing her, he asked her the name of the waltz.

'Oh, don't you waltz? My sisters will introduce you to a partner,' she said, not answering his question. 'I hope they have not neglected you.'

'Thank you. I prefer not to waltz. My head is not too strong since my fever, and I am afraid to trust myself in a round dance. The consequences might be disastrous were I to measure my length and drag my partner with me to the floor. But if you have no objection, and I do not interrupt your playing, I will stay where I am.'

'Stay, by all means. I applaud your prudence from selfish motives. What should I do if you broke up my party by breaking your arm in your fall? You must find it very tiresome, not being able to dance. I should hate it myself, therefore I can feel honestly sorry for you.'

'Not more sorry than I am for myself; but this fever is a horrible bore. I had it before I left Mexico. I never thought to get home. I sometimes wish I had not. It has been such a miserable home-coming.'

He said this with a sigh that made Daphne look very sympathetic, and delightfully interesting. She was doing her best to keep time; but her emotions were great obstructionists. Her mother would have found them alarmingly 'indelicate.' They savoured of that 'foolishness' that is dangerously like falling in love.

Her fingers were discoursing of the 'Blue Danube,' while her eyes looked into his with so much sympathy, that he was glad to pour out what his 'home-coming' really had been into her kind little heart.

'What a dear little soul it is!' he thought. 'I am sure she is good.'

'Oh, this dreadful waltz!' thinks Daphne. 'I wish it were at an end. The basses won't come right. I am making such a hash of it. But I must listen.'

'I am to be pitied,' he was saying. 'I left a father, mother, sisters, all at home, and not one of them is left to welcome me back! I can't describe to you the desolate feeling I experienced. I felt inclined to call a cab, and leave the house the moment I had entered it. It seemed like a grave. My poor mother died, as you know, last year. My sisters married, and went to India. Of all I parted from, there is only our poor old housekeeper left to welcome me on my return!'

'Oh, how dreadfully sad! I am so sorry for you,' cries Daphne, getting hopelessly wrong in her rendering of the 'Blue Danube.' She wished she could tell him that she was sorry she was not a relation of his so as to offer him what consolation she could. She was young and simple, and pitied him sincerely.

What she could not say, she evidently looked to some purpose. He read it in her pretty eyes, and loved her for it. It was the first sympathy he had had for many a day. He was soon telling her all his troubles, as if he had known her for years. He could not help it. She attracted him, and he had never been one to resist.

Daphne's waltz was getting worse and worse.

'I am afraid they won't thank me for my bad music,' she said, laughingly, during a pause.

'I suspect I am the culprit; I have no right to interrupt you.'

'I really think I have thumped long enough, don't you?' she said, rising from the piano at last.

It had been a fatal ten minutes for them, although neither guessed it.

'I like Mr. Grey,' said Daphne, as she passed Mrs. James. 'His manners are so good.'

'So it seems,' said Mrs. James, curtly, 'I see you have begun a flirtation already. I am sure mother will be anything but pleased.'

'I can't help that,' said Daphne, glancing across the room, where she caught sight of her mother's pearl-grey satin dress and white cap.

'Mother is not worrying herself about me to-night.'

'Well, you had better be careful,' said Mrs. James, mounting propriety guard.

'Don't alarm yourself. There is no such luck in store for me!' cried Daphne, with a saucy laugh.

Old Mr. Lee's spirits always rose with the announcement of supper. A party in his eyes was a most unnecessary expense; but when he had handed down the chief lady and had sat her on his right, and saw the viands spread out before him, shining with gelatine and blossoming with carrot and turnip roses, it was a reviving sight. He took up his post before the boned turkey, from which it was impossible to move him throughout the rest of the night. He would as soon have thought of giving up the key of his strong-box as of relinquishing his position before this *pièce de résistance*. As one lady supped another took her place, while he remained immovable. It was a duty he owed himself and his friends that every slice of the turkey should pass through his knife.

Mr. Grey took care to secure Daphne for supper. A very ideal meal she found it. Mr. Grey was so pleasant, so different to the men in Cartown. It was like being with an old friend, she thought, as they lingered long over the table.

Mr. Lee, whose eyes as a rule seldom wandered far from the turkey, happened to look up, and thought Daphne and the stranger by far too friendly. Mr. Grey had turned half round, and was listening, smiling and amused at Daphne's naïve remarks, when Mr. Lee caught her eye, and he said, significantly,

'Daphne, you had better go upstairs, and see if all your friends have had supper.'

She saw and heard both look and command, and knew what they meant. She blushed violently, as if hurt.

'What an old brute!' thought Mr. Grey, who saw what passed and understood at once.

'I must go,' said Daphne, rising. 'But do not let me disturb you. You have not finished your supper.'

'Never mind that. I could not think of letting you go alone,' he answered, rising, and following her upstairs. When they had reached the drawing-room door he stopped her, saying—

'I will wish you good-night, as I am on the sick-list still, and have been forbidden late hours. Kindly say good-night for me to the rest of your family.'

Putting out his hand, he took hers, adding pointedly—

'I have to thank *you* for a very pleasant evening. I hope we may meet again soon.

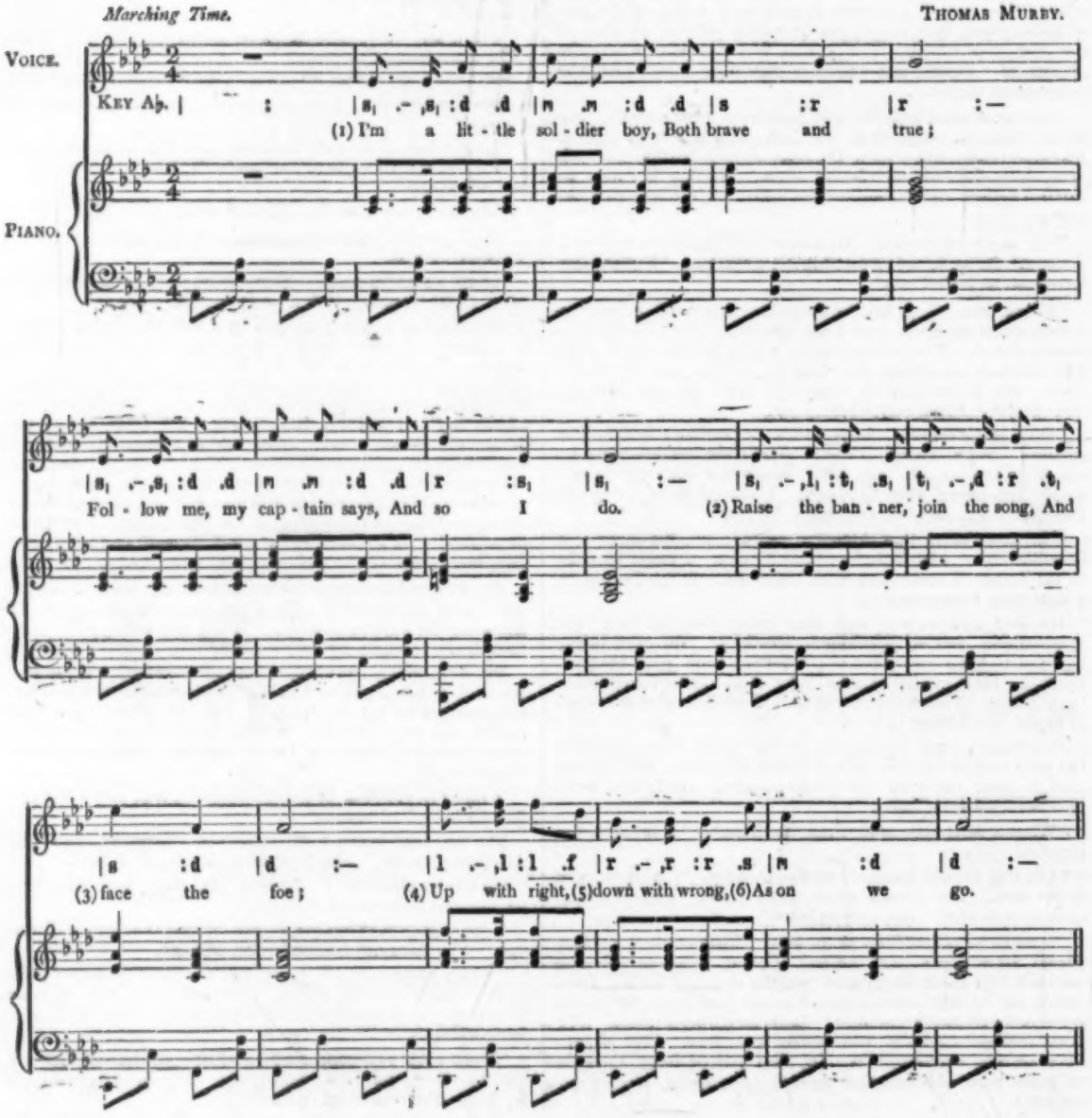
Daphne's presentiment grew apace. Now it took a new form. It was very strange—but it was nevertheless quite true, that as her hand lay in his at parting, she heard distinctly two ominous words—as if some one about her were saying them—they were 'I will.'

They haunted her throughout the night.

(To be continued.)

SOLDIER BOY.

(A Kindergarten Action Song.)

Marching Time. THOMAS MURBY.

VOICE.
PIANO.
KEY A♭.
(1) I'm a lit - tle sol - dier boy, Both brave and true;
Fol - low me, my cap - tain says, And so I do.
(2) Raise the ban - ner, join the song, And
(3) face the foe;
(4) Up with right, (5) down with wrong, (6) As on we go.

2. (7) May I be a soldier boy,
Both brave and true?
Have you in your army bright,
Quite room for two?
(8) Raise the banner, join the song, &c.

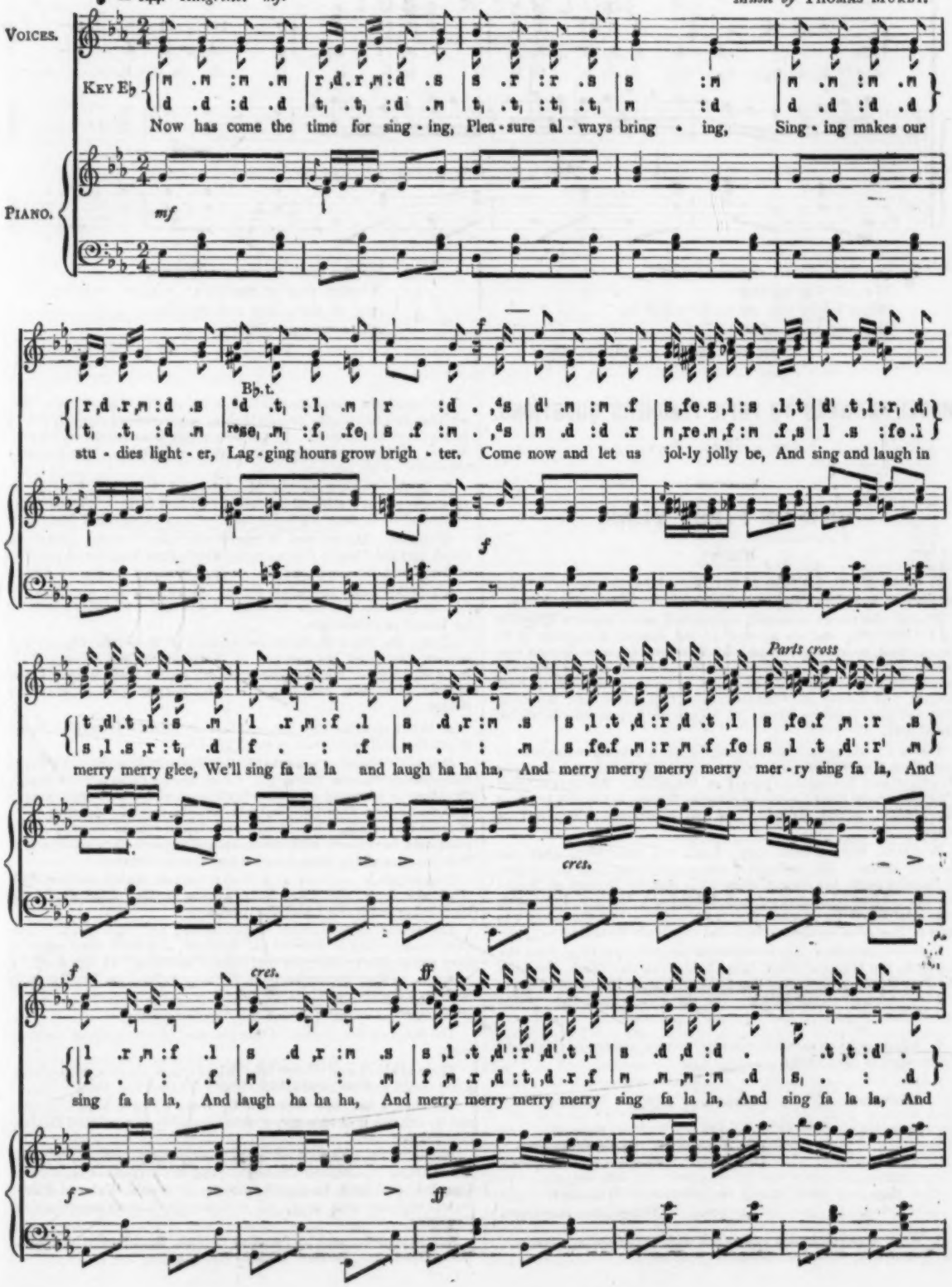
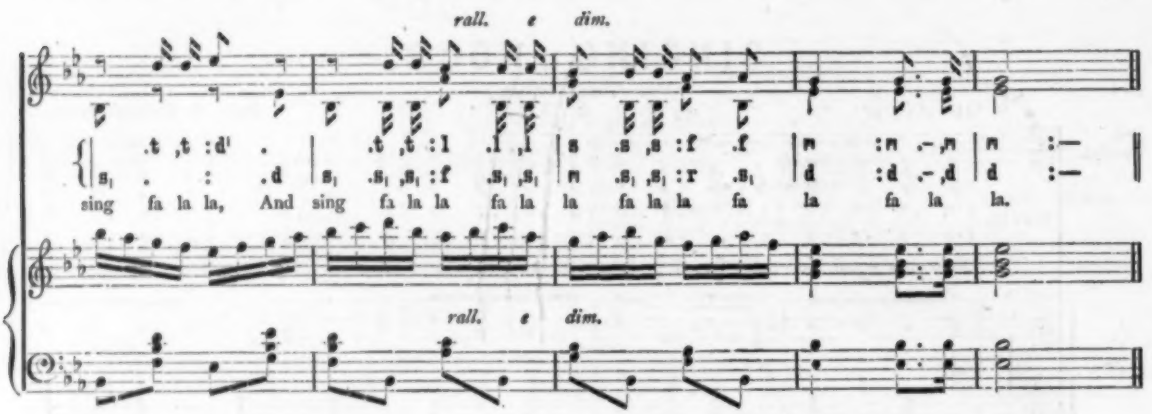
3. (9) I'm a little soldier boy,
Both brave and true?
I can wave the banner see,
Will this not do?
(10) Raise the banner, join the song, &c.

ACTIONS.—(1) Mark time for the first four lines. (2) March. (3) Present! Fire! (4) Raise right hands. (5) Throw down right hands. (6) March. (7) Mark time. (8) Repeat actions (2), (3), (4), (5), and (6). (9) Mark time. (10) Repeat as before.

SINGING HOUR.

(For Two Voices.)

♪ = 144. *Allegretto. mf.*

Music by THOMAS MURBY.

VOICES.
KEY E♭
Now has come the time for sing - ing, Plea - sure al - ways bring - ing, Sing - ing makes our
PIANO.
mf
f
B♭.t.
stu - dies light - er, Lag - ging hours grow brigh - ter. Come now and let us jol-ly jolly be, And sing and laugh in
f
Parts cross
merry merry glee, We'll sing fa la la and laugh ha ha ha, And merry merry merry merry mer - ry sing fa la, And
cres.
f
cres.
ff
sing fa la la, And laugh ha ha ha, And merry merry merry merry sing fa la la, And sing fa la la, And
f
ff

2. In the dark and stormy weather,
We will sing together;
When bright falls the sunlight o'er us,
Raise again the chorus.
Come now and let us jolly be, etc.

3. Singing tends to make us healthy,
Whether poor or wealthy;
Sing on then, sing ever sweetly,
All in tune completely.
Then come and let us jolly be, etc.

MODEL ANSWERS TO PUPIL TEACHERS' QUESTIONS.

April 18th, 1891.

END OF FIRST YEAR.

History.

1. When did the kingdom of Mercia rise into prominence? Trace roughly its boundaries and say what you know of any of its kings.

Mercia, the *march* or border, was erected into a separate kingdom by Crida in 586, and on account of the martial disposition of its populations, which was fostered by its central position, it soon rose into importance. It had, however, frequently to acknowledge the overlordship of a Bretwalda like Ella of Sussex, Redwald of East Anglia, and Edwin of Northumbria. This latter was, however, defeated and slain by Penda of Mercia in 633 at the battle of Heathfield.

Penda was the great champion of the old heathendom against the prevailing Christianity, and in 642 he also defeated and slew the Northumbrian Bretwalda Oswald at Maserfeld. For a few years after his victory Penda stood supreme in Britain, but at the battle of Winwidfield, in 655, he was slain and Northumbria regained its power.

Wulfhere, his son (659—675), had for a time more than his father's success. He captured London, and also built the Abbey of Peterborough, but was subdued for a time by Ecgfrith of Northumbria. After Wulfhere succeeded Ethelred, Ceolred, Ethelbald, who established for a time their overlordship, but the latter was slain at Secandun by the revolted and victorious West Saxons (755).

In its greatest days Mercia extended (roughly speaking) from the Ribble to the Humber, from the Humber to the Wash, from the Wash to Reading, from Reading to Bristol, from Bristol to Chester, and from Chester to the Ribble. All the area within these points was Mercia.

2. Whom can you mention among the early writers in England? Name some of their works.

Writers.	Period.	Works.
Beowulf (?).	450—550.	Beowulf.
	450—1160.	Saxon Chronicle.
Cædmon.	Died 680.	Paraphrase of Scripture.
Aldhelm.	,, 709.	On Science.
Bede.	,, 735.	Theology.
Alfred.	,, 901.	Translations and Laws.

3. What associations are connected with the following names:—*Arthur, Aidan, Wedmore, Glastonbury, Tostig?*

Arthur is the semi-fabulous hero-king of the West Britons who, with his knights of the Round Table, opposed the incoming tide of Saxons and heathenism. In 520 he severely defeated the invaders at Mount Badon, but in 542, after many vicissitudes, he was foully murdered by his nephew.

S. Aidan came from the Monastery of Iona and founded an episcopal see in the island-peninsula of Lindisfarne. Through him Northumbria became Christian and S. Chad evangelised Mercia.

Wedmore. Hereat was a treaty concluded betwixt Alfred the Great and the Danish Guthrum, by which East Anglia and portions of Essex and Mercia were ceded to the Danes for settling therein.

Glastonbury was renowned for its ancient abbey, of which the famous Dunstan was once the head. It was said to have been founded by Joseph of Arimathea.

Tostig, the son of Godwin, and brother of the heroic Harold II., was expelled from his earldom of Northumbria on account of his lust and cruelty. He brought upon his native land the invasion of Harold Hardrada, and with this latter he was slain at Stamford Bridge.

4. What remains can you mention of British, Roman or Saxon origin that still exist south of the Tyne?

British. The most remarkable British antiquities are to be found on Salisbury Plain in Wiltshire. Chief among these is Stonehenge, an extensive group of gigantic standing stones, which seen from a distance appears disorderly, but when closely studied presents a work of great magnitude, whose origin and design remain obscure. The plain itself is covered with those ancient sepulchral mounds called barrows, containing British and some Roman remains.

Stonehenge is enclosed in a double mound, with a shallow ditch of circular form, and there is an avenue leading from the N.E., bounded on each side by similar works.

The whole work consists of two circles and two ovals. The outer circle, which is 108 feet in diameter, consisted when entire of sixty stones (thirty uprights and thirty transverse) 14 feet long by 7 broad. These appear to have been brought from Marlborough Downs, a distance of about 16 miles.

Of the outer circle 25 stones still remain standing.

The Inner circle consisted of thirty stones, of which eleven continue erect.

There is also found a large blue slab of coarse marble 16 feet long, 4 feet broad and 20 inches thick, which is called the Altar.

Stonehenge has been supposed by some to have been a temple, and by others an observatory; most probably it combined the two characters.

Roman. The walls of York and Chester, and the relics of Watling Street (from London to Chester), Foss Way (from Cornwall to Lincoln), Ryknield Street (Newcastle to South Wales), Icknield Street (mid-east and west), all evidence the Roman occupation of England.

Roman remains are also found at London, S. Albans, Colchester, Bath, Gloucester, Bartlow Hills in Essex, etc.

Saxon. Offa's Dyke, a rampart or boundary extending from the vicinity of Newmarket in Flintshire, traversing the counties of Flint, Denbigh, Salop, Radnor, Hereford, and Monmouth to Beachley, at the mouth of the Wye, was erected by King Offa in the eighth century as a boundary between Wales and England.

Although no Saxon cathedrals remain, yet in numerous instances portions of them are purely Saxon, having been incorporated into the present edifices by the Norman architects.

Numerous Runic stones of the Saxon period are to be found, amongst which may be mentioned one in S. Peter's Churchyard, Wolverhampton, and another in the churchyard at Prestbury, Macclesfield.

A fine specimen of Saxon tumuli exists at Thetford in South Norfolk.

5. Point out the influence which the life and character of Edward the Confessor had upon the events occurring after his death.

(*a*) Edward the Confessor had spent most of his life, previous to his accession, at the Norman Court. Accordingly when he became king he imported into England many Norman favourites, who became covetous of the wealth of the land. It is said also that in a moment of weakness he unconstitutionally had promised the crown at his decease to William.

(*b*) Edward's character rendered him entirely unfit to cope with the unruly Earls and the dissensions of races. The prime need of England was a strong ruler, who would have curbed the power of the great vassals, obliterated the influences of the Heptarchy, and fused the Saxons and Danes into one homogeneous people.

But the Confessor's weakness led him to 'play off' one noble against another, to introduce a third element, the Normans, and to neglect the development of his military and naval resources.

(*c*) Thus the Norman Duke found his people somewhat eager to despoil England, whilst the English were disunited and unprepared.

Grammar and Composition.

1. *Parse and analyse this sentence:—*

But Knowledge to their eyes her ample page
Rich with the spoils of Time did ne'er unroll.

ANALYSIS.

SUBJECT.	PREDICATE.	OBJECT.	EXTENSION OF PREDICATE.
(But) Knowledge	did unroll	her ample page rich with the spoils of time	to their eyes ne'er

But—adversative conjunct. introducing the sentence.
Knowledge—proper noun (personified), sing., 3rd, fem., nom., subj. to *did unroll*.
to—prep. gov. *eyes*.
their—pers. pronoun, plural, 3rd, com., poss., qual. *eyes*.
eyes—com. noun, plural, 3rd, neut., obj., gov. by *to*.
her—pers. pron., sing., 3rd, fem., poss., qual. *page*.
ample—adj. of quality, positive, used attribut., qual. *page*.
page—com. noun, sing., 3rd, neut., obj., gov. by *did unroll*.
rich—adj. of quality, posit., used attrib. to *page*.
with—prep. gov. *spoils*.
the—definite art., points out *spoils*.
spoils—com. noun, plural, 3rd neut., obj., gov. by *with*.
of—prep., gov. *Time*.
Time—com. noun, sing., 3rd, neut., obj., gov. by *of*.
did—verb, irreg. (strong), trans., act., indic., past tense, sing., 3rd, agrees with its subject *knowledge*, and gov. [to] *unroll*, etc.
ne'er—adv. of Time, negative, mod. *did unroll*.
[*to*] *unroll*—verb, reg. (weak), trans., act., infin., gov. by *did* and gov. *page*.
did [*to*] *unroll*—verb, reg. (weak), trans., act., indic., past definite (emphatic form), sing., 3rd, agrees with its subj. *knowledge* and gov. *page*.

2. *Give the past tense and past participle of these verbs:—*

VERBS.	PAST TENSE.	PAST PARTICIPLE.
Strive	Strove	Striven
Do	Did	Done
Build	Built	Built
Shake	Shook	Shaken
Hang	Hung	Hung
Win	Won	Won
Burst	Burst	Burst
Sink	Sank	Sunk
Rise	Rose	Risen
Shoot	Shot	Shot

3. *Give the Feminine of the following words:—*

MASCULINE.	FEMININE.
Earl	Countess
Bachelor	Spinster, Maid
Monk	Nun
Wizard	Witch
Testator	Testatrix
Hero	Heroine
Duke	Duchess
Stag	Hind

4. *What is the meaning of the final syllable in each of the following words:—*

WORD.	FINAL SYLLABLE.	MEANING OF SYLLABLE.	MEANING OF WORD.
Friendly	-ly	like	disposed like a friend
Restful	-ful	full	full of rest
Penniless	-less	devoid of	without money
Strongest	-est	has an intensive force	most strong
Golden	-en	made of	made of gold
Princess	-cess	denotes female sex	a female prince
Duckling	-ling	has a diminutive force	a little duck
Greatness	-nes	state of being	Magnitude, size, power

5. *Explain the following terms:—*

TERMS.	EXPLANATION.
Transitive Verb	When the action denoted by the verb is not restricted to the doer, but takes effect upon something else, the verb is termed TRANSITIVE, as *John killed James*.
Relative Pronoun	RELATIVE PRONOUNS not only stand in place of Antecedent Nouns (or Pronouns), but have also a connective or adjective force, as '*Felix*, WHO *had been recalled to Rome, left Paul bound*,' '*The cow* WHICH *was sick is dead*.'
Indefinite Numeral Adjective	INDEFINITE NUMERAL ADJECTIVES denote in a general but not precise way *how many* of any particular thing are spoken of.

Composition.

[The passage should be read *twice* distinctly, and then the substance of it is to be written down from memory.]

Early on Monday morning a fire broke out in the store-room of a bakehouse. The room, which is situated over the bakehouse, contained 70 sacks of flour, and as the flames reached them they burst. The Fire Brigade attended, and began to play on the burning premises. As fast as the water was poured into the store it found innumerable outlets, carrying with it a large quantity of the flour. In a few minutes the whole brigade were ankle deep in flour and water, and gave anything but a graceful exhibition of how dough can be kneaded with the feet. The process brought with it considerable difficulty, for soon the firemen, while fighting the flames, had to struggle with the dough which was hampering their movements. A cry of distress came from one of them, and, on going to the rescue, his comrades found that he was stuck fast in the dough. He could not extricate himself, try how he would. Several of his colleagues caught hold of him, and with a united pull they drew him out, but he had to part company with his boots, for they refused to

move. When the brigade returned to the fire-station they were covered from head to foot with flour and dough. It was a curious contrast with the customary dirt with which their clothes are smeared at a fire.

Arithmetic.

BOYS.

1. Reduce $\frac{3}{10}$ of £1 6s. 8d. + $\frac{4}{15}$ of half-a-guinea + $\frac{1}{16}$ of 1s. + $\frac{2}{13}$ of £1 to the fraction of £2 11s. 5d.

	£	s.	d.		s.	d.
$\frac{3}{10}$ of	1	6	8	=	8	0
$\frac{4}{15}$ of	0	10	6	=	1	$10\frac{1}{2}$
$\frac{1}{16}$ of	0	1	0	=	0	$3\frac{3}{4}$
$\frac{2}{13}$ of	1	0	0	=	2	$\frac{8}{12}$
						$10\frac{1}{2}$

£	s.	d.	f.
0	12	$10\frac{1}{2}$	= 617
2	11	5	= 2468

$\frac{617}{2468} = \frac{1}{4}$. Ans.

2. Divide 7·32375 by 105 by factors (3 × 5 × 7).

105 { 3)7·32375
5)2·44125
7) ·48825
·06975 Ans.

3. If 10 piastres are equivalent to £1 13s. 9d., and 25·3 francs to £1, how many francs are equivalent to 7·5 piastres?

	£	s.	d.
10 piastres are worth	1	13	9
7·5 " "	1	5	$3\frac{3}{4}$

£	s.	d.		
1 : 1	5	$3\frac{3}{4}$	::	25·3

960 20
25
12
303
4
1215

27
81
19 $\frac{\cancel{76}}{\cancel{4}}$ $\frac{\cancel{1215}}{\cancel{5}}$ francs
$\frac{\cancel{76}}{\cancel{4}} \times \frac{\cancel{1215}}{\cancel{5}} = \frac{\cancel{3}}{\cancel{1}} \times \frac{\cancel{243}}{\cancel{1}}$
729
243
81
27
9
3
1

$\frac{513}{16} = 32\frac{1}{16}$. Ans.

4. (*a*) Explain the error in the following:—$\frac{2}{3} + \frac{5}{7} = \frac{2+5}{3+7} = \frac{7}{10}$.

The chief error is in assuming that *thirds* and *sevenths*, when added together, make *tenths*. It is thus taken for granted that two things of one sort and five things of a second sort make seven things of a third sort. This is really as absurd as saying that 2 ducks and 5 pigs make 7 sparrows.

(*b*) Reduce $\frac{3717}{4956}$ and $\frac{1824}{2736}$ to their lowest terms, and then add them together.

$\frac{3717}{4956} = \frac{3}{4}$. Ans.

$\frac{1824}{2736} = \frac{12}{17}$. Ans.

$\frac{3}{4} + \frac{12}{17} = \frac{51 + 52}{68} = \frac{103}{68} = 1\frac{35}{68}$. Ans.

GIRLS.

1. Find by practice the cost of 3 qrs. 16 lbs. at £17 10s. per ton.

	£	s.	d.		
	17	10	0	cost of ton	
2 qr. = $\frac{1}{10}$ of 1 ton		8	9	"	2 qrs.
1 qr. = $\frac{1}{2}$ of 2 qrs.		4	$4\frac{1}{2}$	"	1 qr.
14 lbs. = $\frac{1}{8}$ of 1 qr.		2	$2\frac{1}{4}$	"	14 lb.
2 lbs. = $\frac{1}{7}$ of 14 lbs.			$\frac{3}{4}$	"	2 lb.
	15		$7\frac{1}{4}$	Ans.	

2.

Chestersgate, Macclesfield,
James Jones, Esq. 8th May, 1891.
Bought of George Campbell, Greengrocer, Florist, &c.

	£	s.	d.
300 oranges at $10\frac{1}{2}$d. a doz.	1	1	$10\frac{1}{2}$
1,250 apples at 5 for 3d.	3	2	6
2,500 eggs at 10 for 9d.	9	7	6
16 boxes of figs, each 5 lbs. 4 ozs., at 7d. per lb. ...	2	9	0
$3\frac{1}{2}$ sacks of potatoes, each 3 bush., at $4\frac{1}{2}$d. per gall.	1	11	6
	£17	12	$4\frac{1}{2}$ Ans.

3. Simplify $3\frac{1}{8} - \frac{6}{7} + 7\frac{5}{14} - 8\frac{9}{14} + 9\frac{11}{20}$

Whole numbers $3 + 7 - 8 + 9 = 11$

Fractions $\frac{1}{8} - \frac{6}{7} + \frac{5}{14} - \frac{9}{14} + \frac{11}{20}$

$= \frac{350 - 360 + 175 - 270 + 77}{420} = -\frac{28}{420} = -\frac{1}{15}$

$11 - \frac{1}{15} = 10\frac{14}{15}$. Ans.

4. Explain fully how to find the Least Common Multiple of three or more quantities.

Find the L.C.M. of 99, 117, and 143.

(*b*) Divisors

3	99	117	143
3	33	39	143
11	11	13	143
13	1	13	13
	1	1	1 Final Quotients.

∴ 3 × 3 × 11 × 13 = 1287. Ans.

(*a*) 1. Set down the numbers as in example above, and divide by any prime factor which is common to more than one of the numbers. In the example, 3 is a prime factor of 99 and 117.

2. Any number not containing this factor must be 'brought down,' as the number 143.

3. Proceed thus until the resulting quotients are either unity or prime to each other, that is they contain no other common factor except unity.

4. Multiply all the divisors and final quotients together, and the product will be the L.C.M.

A little consideration will show that every factor not common is retained, and that every common factor is retained only once, and that therefore the product of these is *first* A Common Multiple and *second* THE LEAST Common Multiple.

Needlework.

Make a closed wristband for a boy's night shirt, and stitch not less than half of it.

For this exercise use your piece of calico 9 in. × 9 in. Cut off a piece 9 in. (selvage way) × 6½ in. The word 'CLOSED' requires to be noticed, as most wristbands are open, shaped, and need a button-hole. First join by running (with an occasional backstitch to make it stronger) the two 6½-in. edges. Open the edges of the join, and turn the material to the right side; fold down about ¼ in. on one edge to the wrong side; tack and draw thread a short distance from the edge on the right side for back stitching.

Next, fold down as before ¼ in. on the opposite edge; double the wristband, so as to make it 3 in. deep. Draw thread at the top of wristband at the same distance from the edge as the other. A little stitching should be done at both edges, in order to prove that the candidate knows how to *complete* the wristband.

Geography.

1. What parts of the British Isles produce the best horses, mutton, butter, cheese, apples, wheat, oats, and flax?

PRODUCT.	WHENCE OBTAINED.
Horses	Suffolk, Clydesdale, mountains of Wales and Scotland, many parts of Ireland.
Mutton	Wales, South Downs, Leicester, Cheviots, Leinster.
Butter	Cheshire, Dorsetshire, Somersetshire, Cork.
Cheese	Cheshire, Derbyshire, Gloucester.
Apples	Devonshire, Herefordshire, Worcestershire.
Wheat	East Anglia, South of Thames, South of Scotland.
Oats	Many parts, especially to the North of England, Ireland and Scotland.
Flax	Lowlands of Scotland, Ulster, North Lincoln.

2. Give some account of the physical features, climate and industries of Victoria and Tasmania, and compare their areas with that of Great Britain.

VICTORIA occupies the south-east corner of Australia. Its MOUNTAIN RANGES, too, are to its south-east, and their general direction is that of the coast-line.

The chief ranges are the Australian Alps in the east, the Pyrenees in the south, and the Grampians in the west. Around Port Philip is a broken mountainous country, and north of the Grampians is the Wimmera district, the most barren portion, containing salt lakes, salt bush flats, and dense scrub.

The chief RIVERS are (commencing at the east) La Trobe, Yara Yara, Hopkins, and the Glenelg, in the extreme west. Most of these have short and comparatively rapid courses.

The Murray forms four-fifths of the northern boundary.

Tyrrell and Hindmarsh are salt LAKES.

The CLIMATE of this colony is very genial and even delicious to Europeans, but during the prevalence of the hot northerly winds of summer everything suffers. The mean annual temperature is 58° and the annual rainfall 30 inches, which falls in about 130 days.

The AREA of Victoria is slightly less than that of Great Britain, both being a little over 88,000 sq. miles.

The chief INDUSTRY is agriculture, but sheep-rearing, mining, manufacturing and general commerce are also important. Gold is found in larger quantities than elsewhere in Australia. Manufactures employ about 50,000 people, and wool, gold, wheat, flour, hides, cattle and preserved meat are exported.

Tasmania (or Van Diemen's Land) is a large island, nearly two-sevenths the size of Great Britain (26,000 sq. miles), situated to the South of Australia and separated from it by Bass Strait. Its coast is considerably indented and is skirted by numerous ISLANDS, among which may be mentioned, on the east, Maria Island, on the south-east, Bruni, on the north-east, Furneaux Isles, and on the north-west, King's Island and Hunter Island.

The whole interior is a considerably elevated plateau, and the different ranges of mountains form an irregular system running from North to South. The highest peaks are Mount Humboldt (5,550 ft.) in the West, and Cradle Mount (5,070 ft.) in Lincoln.

Tasmania is fertile and well watered. The principal STREAMS are the Tamar (130 miles), which flows north into Bass Straits; the Derwent, flowing south-west into Storm Bay; and the Heron, flowing east and south into D'Entrecasteaux Channel.

The chief LAKES are Great Lake, St. Clare, and Sorell.

In CLIMATE the colony is temperate, agreeable, and well suited to Europeans. There is a marked absence of the dreaded and scorching hot winds of Australia. The average temperature is 54°, and the annual rainfall 24 inches, which falls in about 140 days.

The main INDUSTRIES are sheep and cattle rearing, agriculture, mining, lumbering, and whale fishing. The chief exports are wool, corn, flour, timber, hides, and sperm oil.

3. Draw a map containing the basins of the Severn and Wye, *or* of the Mersey, Ribble, Lune, and Eden.

[See any good Atlas.]

4. What effect have its mountain ranges upon the climate of British Columbia?

The mountain ranges of British Columbia both shelter the province from the cutting north and east winds, give it a south-westerly aspect, and help to intercept the moisture-laden clouds from the Pacific. Thus the climate in summer is more equable and humid than for many places of corresponding latitude. The winter is rather rainy than snowy, and the average rainfall is 41 inches.

5. Describe a coasting voyage from Liverpool to Plymouth.

Starting from Liverpool, upon a pleasure excursion, from amidst a forest of masts and funnels, we quickly get over the bar of the Mersey, and see in the offing one of the great American 'liners' steaming speedily to New York.

Then turning West, we skirt the coast of North Wales, with its massive promontories and popular watering-places, such as Rhyl, Abergele, Conway, &c.

Next, instead of passing through the Menai Straits, our vessel rounds Anglesey, giving a wide berth to the dreaded Stack rocks, where the ill-fated 'Royal Charta' was lost. To the north west of the island we see Holyhead, and witness a 'race-in' between the North Wall (Dublin) and Kingstown packets.

Our direction is next due south, and on our left Snowdon uprises with its twin summits, and soon after such places of resort as Barmouth, Towyn, and Aberystwith are passed.

Still tending south we pass the coasts of Pembrokeshire, and make a half turn to the south east, to come within range of Lundy Island.

Whilst taking this course we sight several ships heavily laden (probably with sugar for Bristol, or corn for Gloucester) sailing up the Bristol Channel.

Having passed Lundy, we proceed along the coasts of Devon and Cornwall, catching a view of Brown Willy, and at last double Land's End, 'whose rocky ridges run far out into the deep.'

Here we experience heavy 'cross-seas,' and for about an hour our bark both rolls and pitches, arousing unenviable internal qualms.

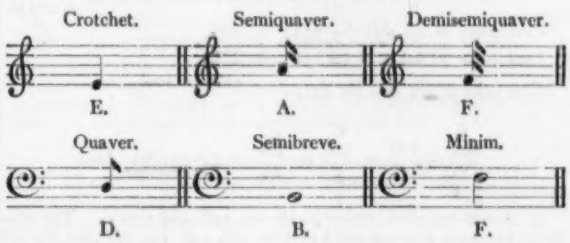
At last we glide into comparatively smooth water, and numerous sails proceed on our right, many of them bound for London.

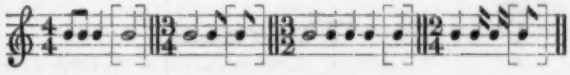
Our captain now kindly diverges somewhat south, in order to afford us a prospect of Eddystone Lighthouse, which lifts its head aloft, 'A pillar of fire by night, of cloud by day.'

Finally, sharply turning due north, we reach Plymouth Sound, and proceed up it past Devonport to Plymouth itself.

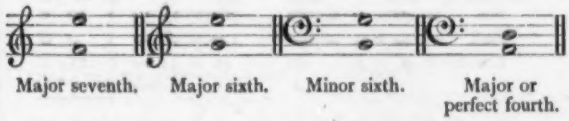
Music.

STAFF NOTATION.

1. Write above each of the following notes its value-name (crotchet, &c.), and below each its pitch-name (C, D, &c.):

2. Complete each of the following bars by adding one note at the end:



3. Write below each of the following intervals its name (major third, &c.):



TONIC SOL-FA NOTATION.

1. What primary or secondary measures are shown by the following pulse-signs?

(*a*) | : | : | : | : | : ‖ Primary four-pulse.

(*b*) : | : | : | ‖ Secondary two-pulse.

(*c*) : | : : | : ‖ Secondary three-pulse.

2. Write the names of the following intervals:

(*a*) s—d' Perfect or major fourth.
(*b*) m—r' Minor seventh.
(*c*) l,—f Minor sixth.
(*d*) m—s Minor third.
(*e*) d—t Major seventh.
(*f*) r—l Perfect or major fifth.

3. Re-arrange the following in *descending* order of pitch:

f, s, f t, s d' m r' d m' t l,
m' r' d' t s f m d t, l, s, f,

END OF SECOND YEAR.

Arithmetic.

BOYS.

1. Find the Compound Interest on £2,756 for 2 years at 4 per cent. per annum to the nearest penny.

	£	s.	d.
5 |	2756	0	0
4 per cent. = $\frac{1}{25}$ 5 |	551	4	0
	110	4	9½ = Interest for 1st year.

	£	s.	d.
Principal	2756	0	0
Interest 1st year	110	4	9½
5 |	2866	4	9½
5 |	573	4	11½
Interest 2nd year	114	12	11¾
Interest 1st year	110	4	9½
Compound Interest	224	17	9¼ Ans.

2. A tradesman sells tea at 2s. 1d. per lb., and takes off 5 per cent. for cash payment. Find what it cost him per cwt., sold for cash, in order that he may make a profit of 33 per cent.

Cash selling price per lb., 2s. 1d. − ($\frac{1}{20}$ of 2s. 1d.) = 1s. 11¾d.

Selling price of cwt. = 1s. 11¾d. × 112 = 224s. − 2s. 4d. = 221⅓s.

Cost price of tea sold for 133s. = 100s.

Cost price of tea sold for 1s. = $\frac{100}{133}$s.

Cost price of tea sold for 221⅓s. = $\frac{221\frac{1}{3} \times 100}{133}$s.

$$\frac{\overset{5}{\cancel{665}} \times 100}{\underset{1}{\cancel{133}} \times 3} = \frac{\text{s.}}{\frac{500}{3}} = \frac{\text{£}}{\frac{500}{60}} = \underline{\text{£8 6s. 8d.}} \text{ Ans.}$$

3. A man travelled 520 miles by sea, rail, and coach. The distance by coach was one-third that by rail, and the distance by rail one-third that by sea. The charges at sea were 1d. per mile, by rail 2d., by coach 4½d. Find the average cost per mile for the whole journey.

Sea : Rail : Coach

3 : 1 : ⅓ ratio of distances.

9 : 3 : 1 ∴ sea = $\frac{9}{13}$, rail = $\frac{3}{13}$, coach = $\frac{1}{13}$

= miles $\frac{520}{13}$ = 40 miles.

Distance travelled by	miles	miles	d.	£	s.	d.
Sea	= 40 × 9 =	360	360 × 1 =	1	10	0
Rail	= 40 × 3 =	120	120 × 2 =	1	0	0
Coach	= 40 × 1 =	40	40 × 4½ =	0	15	0
			Total	3	5	0

£3 5s. 0d. ÷ 520 = $\frac{\text{s.}}{\frac{65}{520}} = \frac{\text{s.}}{\frac{1}{8}} = \frac{\text{s.}}{\frac{1}{8}} = \underline{1\frac{1}{2}\text{d.}}$ Ans.

4. (*a*) By investing £960 in a 2¼ per cent. stock, I obtain an income of £30 per year. What is the price of the Stock, neglecting brokerage?

Sum invested to obtain income of £30 = 960

" " " 1 = $\frac{960}{30}$

" " " 2¼ = $\frac{2\frac{1}{4} \times 960}{30}$

$$\frac{9 \times \overset{32}{\cancel{960}}}{\underset{1}{\cancel{4}} \times \underset{1}{\cancel{30}}} = \underline{\text{£72.}} \text{ Ans.}$$

(*b*) Define *stock, funds, consols, par, brokerage.*

Stock is money, generally divided into shares, lent at a certain rate of interest to a Government, Corporation, or Public Company, the lender retaining the privilege of transferring his shares to others, but abandoning the right to call-in the Principal.

The Funds is that (and by far the greater) portion of the British National Debt which is held by Stockholders.

Consols is an abbreviation for *Consolidated Funds*, various species of Stock having been consolidated into three per cents.

Par. When the nominal value and the actual value of stock are equal this stock is said to be at *par*. When a £100 of stock is worth £100 of cash, the stock is at par.

Brokerage is a commission which a dealer in stock charges, and it is generally ¼ per cent. When a stock changes hands there is a *double charge* for *brokerage*, the buyer paying ¼ per cent. more than the price, and the seller receiving ¼ per cent. less.

GIRLS.

1. Simplify $\frac{\frac{1}{5}+\frac{1}{6}-\frac{1}{2}-\frac{1}{3}}{\frac{1}{5}-\frac{1}{6}-\frac{1}{2}+\frac{1}{3}} \div \frac{89}{61} = \frac{\frac{11}{30}-\frac{1}{30}}{\frac{30}{30}-\frac{11}{30}} \div \frac{89}{61} =$

$\frac{\frac{1}{5}+\frac{1}{6}+\frac{1}{2}-\frac{1}{3}}{\frac{1}{5}-\frac{1}{6}+\frac{1}{2}+\frac{1}{3}} = \frac{\frac{1}{30}+\frac{30}{30}-\frac{11}{30}}{\frac{1}{30}+\frac{30}{30}+\frac{11}{30}} = \frac{\frac{10}{30}}{\frac{41}{30}} \div \frac{89}{61} =$

$\frac{11-\frac{1}{11}}{11+\frac{1}{11}} \div \frac{60}{61} \quad \frac{10\frac{10}{11}}{11\frac{1}{11}} \div \frac{60}{61}$

$$\frac{\overset{1}{\cancel{120}} \times \overset{1}{\cancel{11}} \times 61}{\underset{1}{\cancel{11}} \times \underset{2}{\cancel{122}} \times \underset{1}{\cancel{60}}} = \underline{1.} \text{ Ans.}$$

2. Reduce 8s. 4½d. to the fraction of £100, and 7 cwt. 7 lbs. to the fraction of 11 cwt. 11 lbs.

(*a*)

s.	d.		£
8	4½		100
8			20
67 = 1½d.'s			2000
			8
		16000 = 1½d.'s	67 / 16000 Ans.

(*b*)

cwts.	lbs.		cwts.	lbs.
7	7		11	11
112			112	
791			1243	

$$113)\ 791\ (\ 7\ \tfrac{7}{11}$$

$$\frac{791}{1243} = \frac{7}{11}. \text{ Ans.}$$

Also 7 cwt. is $\frac{7}{11}$ of 11 cwt., also 7 lbs. is $\frac{7}{11}$ of 11 lbs., ∴ 7 cwt. 7 lbs. is $\frac{7}{11}$ of 11 cwt. 11 lbs.

3. Find the value of $\frac{13}{1760}$ of a mile − $\frac{7}{88}$ of 3½ furlongs − $\frac{5}{16}$ of 49½ yards.

		fur.	pls.	yds.	ft.	in.
$\frac{13}{1760}$ of a mile	=	1	6	0	1	0
		fur.	pls.	yds.	ft.	in.
$\frac{7}{88}$ of 3½ furlongs	=	0	25	1	1	7
$\frac{5}{16}$ of 49 yds. 1 ft. 6 in.	=	0	2	2	2	3
		0	27	4	0	10

Fur.	pls.	yds.	ft.	in.	
1	6	0	1	0	
0	27	4	0	10	
0	18	1½	0	2	Ans.
or 0	18	1	1	8	Ans.

4. If I divide a sum of money among four girls, giving one-third of it to A, one-fourth of the remainder to B, three-fifths of the remainder to C, and the 5s. left to D, find the whole sum.

A has ⅓

B has ($\frac{1}{4}$ of $\frac{2}{3}$) = $\frac{1}{6}$ $\quad \frac{1}{3}+\frac{1}{6}=\frac{1}{2}$

C has ($\frac{3}{5}$ of $\frac{1}{2}$) = $\frac{3}{10}$

$$\frac{1}{3}+\frac{1}{6}+\frac{3}{10} = \frac{10+5+9}{30} = \frac{24}{30}$$

$1 - \frac{24}{30} = \frac{1}{5} = 5\text{s.}$

whole sum

= 5s. × 5 = £1 5s. Ans.

N.B.—It should be noted that this problem is ambiguously worded as regards the use of the term 'remainder.'

English.

1. PARAPHRASE the following passage:—

The fair breeze blew, the white foam flew;
The furrow followed free;
We were the first that ever burst
Into that silent sea,
Down dropped the breeze, the sails dropped down,
'Twas sad as sad could be;
And we did speak only to break
The silence of the sea.

(COLERIDGE'S 'ANCIENT MARINER'.)

We sailed along with a favouring wind, amid the fleecy spume, leaving our track marked upon the waves. No one had previously invaded that quiet ocean.

Suddenly the sails drooped idly from the masts, and there was a calm which made us profoundly melancholy. We spoke little, and only then to disturb the all-pervading stillness of the deep.

2. Analyse the sentence and parse the words underlined :—

We look before and after,
And pine for what is not ;
Our sincerest laughter
With some pain is fraught :
Our sweetest songs are those that tell of saddest thought.

Sentence.	Kind of Sentence.	Subject.		Predicate.		Object.	
		Simple.	Enlargt.	Simple.	Extension.	Simple.	Enlargt.
(*a*) We look before and after	Principal	We		look	before and after		
(*b*) We pine for what is not	Principal	we	(and)	pine	for what is not		
(*b* 2) What is not	Noun sent., gov. by *for*	what		is	not		
(*c*) Our sincerest laughter .....some pain	Principal	laughter	our sincerest	is fraught	with some pain		
(*d*) Our sweetest songs are those ....saddest thought	Principal	songs	our sweetest	are those .....thought			
(*d* 2) which tell of saddest thought	Adjective, qual. those	that		tell	of saddest thought		

before—prep., used as an adv. mod. *look.*
wh it—indefinite pronoun, sing., 3rd, neuter, nom., subject to *is.*
sincerest—adjective of quality, superlative, used attributively, qual. *laughter.*
fraught—past partic. of the verb *to freight*, forming with *is* the passive present indicative of *freight.*
those—demonst. pron., plural, 3rd, neuter, nom., subject after *are.*
that—simple rel. pron., plural, 3rd, neuter, nom., subject to *tell*, and agrees with its antecedent *those.*
tell—verb, irreg. (strong), trans., act. v., indic., present, plural, 3rd, agrees with its subject *that*, and governs [.....].

3. Explain the force of the syllables printed in italics in each of the following words, and give another example illustrating the use of the same prefix or affix :—

*In*direct — *Pre*determine
*Circum*locution — Add*ition*
Signi*fy* — *Co*-operation
*Re*spond — *De*duct

Prefix or Affix.	Meaning.	Example.
In-	not	*in*sufficient
Circum-	about or round-about	*circum*ference
Re-	again or back	*re*ply
Pre-	before	*pre*dispose
Co- [cum]	with	*co*-ordinate
De-	from	*de*stroy
(fio) *-fy* (facio)	to make	fructify
-tion	state or operation of	subtraction

4. How many adverbs be classified? Give examples of adverbs in each class.

(*a*) Of Place, as *here, thither, whence.*
(*b*) Of Time, as *now, never, before, often.*
(*c*) Of Manner, as *wisely, little, so.*
(*d*) Of Degree, as *very, equally, nearly, how.*
(*e*) Of Cause and Effect, as *because, since.*
(*f*) Numeral, as *firstly, lastly.*
(*g*) Interrogative, as *when, where, how, why.*
(*h*) Responsive, as *yes, perhaps, no.*

Interrogative and negative adverbs are to be found in several of the preceding classes.

5. Explain the terms *nominative absolute, participial phrase, adverbial sentence,* and give examples of each.

(*a*) The *nominative absolute* (more properly called the *absolute case*) is always adverbial in function, and is constructed by making a participle agree with a noun, instead of employing the noun as subject to the finite verb of an adverbial sentence.

Examples.—
The *train* having started, he had to walk (Showing cause).
Prayers said, the congregation separated (Showing time).

(*b*) *Participial phrases* consist of a participle and some appended modifying or governed words.

Examples.—
The flag *waved around his head* was the appointed signal.
The boat *skirting too closely the coast* was wrecked.

(*c*) An *adverbial sentence* (or clause) is merely a compound adverb, where the work of modification is done by a sentence instead of a word.

Examples.—He came *when I had gone* (Time).
He died *because he grieved so much* (Cause).
Do *as you would be done by* (Manner).

History.

1. Give a short account of any three of these :—

Doomsday Book is a register of the extent, value, population, and state of cultivation of all the lands in England, according to a survey instituted, and in great measure completed (in 1086), during the reign of the Conqueror. It is still in existence and furnishes us with more valuable information about the eleventh century than any other nation possesses. It was compiled for military and revenue purposes.

Constitutions of Clarendon were drawn up at Clarendon in 1164, and were at once agreed to by the barons and Henry II., but reluctantly by Becket. Their object was to settle the existing disputes between Church and State. They were sixteen in number, ten of which were solemnly condemned by Pope Alexander, and the remaining six merely tolerated. The most important articles were: That clergymen charged with crimes, and that all civil causes not strictly ecclesiastical, should be tried in the king's courts; that no prelate should be elected and no church dignitary leave the kingdom without the king's permission; that no excommunications be issued against the king's officers and no appeal be made to Rome without his consent; and that the king should enjoy the revenues of vacant sees.

Provisions of Oxford were drawn up in 1258 by 'the Mad Parliament,' under the guidance of Simon de Montfort, Earl of Leicester. The principal points were :—

(1) A Council of State of fifteen persons was appointed to *advise* the King, or rather to rule in his name.

(2) Four knights were to be appointed by the freeholders of each county to ascertain and lay before Parliament all wrongs committed by the king's officers.

(3) Parliament was to meet three times a year.

The Canterbury Tales, Chaucer's greatest work, was not compiled until after 1386. They are a collection of twenty-four stories imagined to be related in verse by nine-and-twenty pilgrims on their way from the Tabard of Southwark to the shrine of the 'holy and blisful' martyr, Thomas à Becket, at Canterbury. Among them may be mentioned the Knight's Tale, the Nunne's Tale, the Parson's Tale, and the Tale of Melibœus, the two last of which are the only ones written in prose.

Wycliffe's Bible was finished in 1383, a year before his death. It fixed the religious dialect of this country, and for 500 years it has continued through Tyndale and the authorised version of 1611 to be the language of devotion and of scriptural translation.

Matt. chap. v. verses 1 to 3. 'And Jhesus seynge the pepole, went up into an hil; and whanne he was sett, his disciplis camen to him. And he openyde his mouthe and taughte hem; and seide, Blessed be pore men in spirit; for the kyndom of hevenes is herun.'

2. Give any instances of our intercourse with Burgundy and Flanders, and show the results.

All through the Norman, Plantagenet, Lancastrian, Yorkist, and Tudor periods the relations of England, both commercial and political, with Burgundy and Flanders were most intimate, and were frequently cemented by state marriages. The *result*, as the following details will show, was a marked increase in England's commercial importance and manufacturing skill.

In William I.'s reign a colony of Flemish cloth weavers settled in Carlisle, and in Henry III.'s reign at Pembroke. During the life of Edward I. the society of Merchant Adventurers was formed, which traded almost solely with Flanders and Burgundy, exporting thither wool, tin, leather, and lead, and bringing back manufactured commodities. Edward III. closely allied himself with Flanders against France, and in 1331 John Kemp, with seventy Walloon families, settled in Kendal. So great was the influx of people from the Low Countries that 15,000 Flemings were at one time expelled from London. During Henry V.'s romantic career the Duke of Burgundy was his faithful ally, and Edward IV.'s sister Margaret married the Duke of Burgundy.

At the time of the Eighth Henry the foreign commerce of England was confined to Flanders, and a singular idea is given of its importance from the fact that when war broke out between the two countries it was decreed that trade was not to be interrupted between them.

3. What do you understand by interdict, excommunication, Peter's pence, investiture, and how are these connected with our history?

An Interdict was a decree from the Pope which suspended religious worship and all solemn rites, except the baptism of infants and the absolution of the dying. It closed all the churches, silenced the bells, and buried the dead in unconsecrated ground without any religious service.

On account of the dispute between John and the Pope, England suffered from it from 1208 to 1214.

Excommunication placed the banned person outside the pale of the Church, and while in that state, he was at the mercy of men while living, and fiends when dead. He forfeited all his offices and all his religious privileges as far as the Papal power could prevail. John was excommunicated in 1215. So great was the power of this dread spiritual weapon, that many decrees were passed to prevent its abuse, notably in the reign of Henry II. (Constitutions of Clarendon), in Edward III.'s reign (Statute of Provisors, &c.), in Richard II.'s reign (Statute of Præmunire), and in Henry VIII.'s and Elizabeth's reigns.

Peter's pence, or *Romescot*, was an annual tribute paid by England to the Pope from 721 until the Reformation. It is said to have been instituted by Ina of Wessex and Offa of Mercia to support an English college at Rome, and it amounted to a silver penny from each household. The laws of Edward the Confessor and William I. limited its application, and those of Edward I. and III. prohibited it. Henry VIII. abolished it, Mary revived it, and Elizabeth gave to it the final quietus.

Investiture was the ceremony which granted admission to the power and dignity of a bishop by delivering to the new prelate a ring and crozier as the symbol of his office. Intimately connected with this was the right to receive homage from the one invested. Accordingly many were the disputes that arose between King and Pope on this account, notably that in the reign of Henry I., which was settled by a compromise.

4. Give a life of any two of the following:—William Wallace, the Maid of Orleans, the Empress Matilda, Warwick the King-Maker.

Sir William Wallace was a patriotic Scotchman, who, after the conquest of his country by Edward I., in 1294, raised a revolt, defeated the English at Cambuskenneth near Stirling, and ravaged Northumberland and Durham. However, in 1298, Edward I., in person, defeated him at Falkirk, and although the embers of the insurrection smouldered for some years, Wallace was at last dastardly betrayed by Sir John Monteith, and was most ungenerously executed at Smithfield as a traitor in 1305.

Joan of Arc, Maid of Orleans, was an innocent French country girl who believed herself delegated by Heaven to free her suffering country from the rapacious English. In 1429 she took the command of the French army and forced our countrymen to raise the siege of Orleans. Many other successes she gained, but being captured by the English in 1413 at the siege of Compiegne, she was burnt as a witch by the Burgundians in the following year.

The Empress Matilda was the daughter of Henry I., and heir to the throne upon his decease. She was twice married, first to the Emperor of Germany and next to Geoffrey of Anjou. From this alliance proceeded Henry II. In 1139, supported by Robert of Gloucester, her half-brother, she invaded England in order to dethrone the usurper Stephen, whom she defeated at Gloucester in 1141. But her petulant feebleness soon betrayed her, and she was compelled to conclude a treaty acknowledging Stephen as King during his lifetime, but securing thereafter the throne for her son Henry II.

Warwick the King-maker, 'the last of the Barons,' was the great mainstay of the Yorkists from 1460 to 1470. He won the battle of Northampton in the former year, but lost that of St. Albans in 1461. Nine years later, being displeased with Edward IV.'s partiality for the Woodvilles, he became reconciled to her in France. Having warmly espoused the Lancastrian cause, he invaded England, but was defeated and slain at Barnet in 1471.

5. Name any early English Charters, statutes, or laws that you think of importance (not including Magna Charta), and give some account of their provisions.

Among the Anglo-Saxons, the laws of Ina of Wessex, Alfred the Great, and Edward the Confessor were held most in esteem. The Charter of Henry I. promised that the nation should be governed by the laws of Edward the Confessor, that no money should be levied but as in Saxon times, that the demesne lands of all his military tenants should be exempted from taxes and burdens, that the king would not let to farm vacant benefices, that any fines should be as in Saxon times, that tenants in chief should be allowed to will their property, that these last might themselves dispose of their female relatives in marriage, that wardships of minors and their lands should be committed to their relatives, that only customary reliefs for land should be paid, and that widows and heiresses should not be forced to marry.

A copy of this Charter falling into the hands of Stephen Langton became the model for the construction of the great Magna Charta.

Needlework.

On a piece of calico, show at least two inches of each of the stitches required in the making of an infant's nightgown.

First, all the stitches required should be *placed*, as none should be left out.

There are many ways in which these stitches may be shown; the following is only a suggestion. Be certain of the stitches really used. Cut the calico into three pieces each 9 ins. × 3 ins. Take care to keep the right way of the calico.

1. *Seaming and Felling.* Join with seam and fell (or run and fell) two of the pieces.

2. *Hemming.* Turn down 1 inch on to right (seam) side like deep hem on bottom of nightgown. On this broad hem, *if time permit*, may be shown a little back-stitching, feather-stitching, and knotting, etc.

3. *Gathering.* Of the remaining loose piece of calico, gather 5 inches, using the remaining 4 inches to place at the back of the gathers. Having turned down a little of the sampler piece, set in the gathers, and place at the back. When all is tacked work a small amount of every stitch that has not yet been represented.

Euclid.

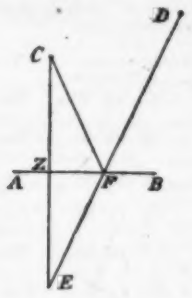
1. If two triangles have two sides of the one equal to two sides of the other, each to each, and have likewise their bases equal, the angle which is contained by the one shall be equal to the angle contained by the two sides equal to them of the other.

See Euclid I., 8.

2. Any two sides of a triangle are together greater than the third side.

See Euclid I., 20.

3. From two given points on the same side of a given straight line draw two straight lines which shall meet in the given line and make equal angles with it.



Let AB be the given straight line, and C and D be the given points.

It is required to draw two lines CF and DF to meet the line A in F, so that the angles CFA and DFB shall be =.

Construction.—Upon AB from C drop the perpendicular CZ; produce CZ to E, making ZE = ZC. Join DE, cutting AB in F. Draw CF.

PROOF.—The triangles FZC and FZE are equal in every respect. (I. 4.)

$\therefore \angle ZFE = \angle ZFC$; but $\angle ZFE$ a'so $= \angle DFB$. (I. 15.)

$\therefore \angle ZFC = \angle DFB$. Q. E. F.

Teaching.

1. Write as a Largehand copy the words *Geometrical Drawing*, and point out which of the letters are likely to present special difficulties to a young scholar, and what rules should be observed in forming such letters.

2. Write out fully, as on blackboard before the class, the following sum, so as to show the separate value of each figure in the answer and also of each of the remainders:—

Divide £7,387 16s. 4½d. by 17.

Divisor.	Dividend.	Quotient.
	£ s. d.	£ s. d.
17	7387 16 4½	400 0 0
	68	
17	£587 16 4½ Rem.	30 0 0
	51	
17	£77 16 4½ ,,	4 0 0
	68	
	£9 16 4½ ,,	
	20	
17	= 186s. 4½ ,,	0 10 0
	17	
	16s. 4½ ,,	
	12	
17	= 196½d. ,,	0 0 10
	17	
17	26½d. ,,	0 0 1
	17	
	9½ ,,	
	4	
17	= 38q. ,,	½
	34	
	4 ,,	£434 10 11½, 4/17q. = Total Rem.
	= 4/17q.	

Geometrical Drawing.

The special difficulties are with the (1) capitals *G* and *D*, (2) the letters *r* and *w*, and (3) *e*, *m*, and *c*.

(1) The Capitals should be double the size of the Smalls, and should be well balanced, the looped part of the *G* being above the Smalls, the down-stroke and up-stroke of the *D* not being too close or too far off, and the head of the *D* being sufficiently massive.

(2) The hooks of the *r* and *w* should be large enough, nearly half the size of the whole letter.

(3) The *e* should not be formed thus (*e*), the head of the *c* should not be too much turned down, and the different portions of the *m* and *w* should not be joined together too close to the bottom and top respectively.

3. Name eight words in the spelling of which young children often make mistakes, and explain by what sort of exercises such mistakes may be corrected or avoided.

(*a*) Words of kindred sound liable to be pronounced defectively, *e.g.*, *as, has, were, where.*

These should have the *h* well aspirated, and the difference in use pointed out.

(*b*) Words where the vowels may be wrongly sounded, *e.g.*, *toil, tile.*

Practise the scholars in the vowel sounds, and explain the meanings of the words.

(*c*) Words in which the sound is the same, but the spelling different, *e.g.*, *pane, pain, there, their.*

Explain the meanings and use, especially when they are different parts of speech.

(*d*) Words of kindred meaning in which the sound is the same, but the use and spelling different, *e.g.*, *practice, practise.*

Show the difference between the verbal and substantive use.

(*e*) Derivatives which drop a letter of the root. *e.g.*, *love, loving.*
Give the rule.

(*f*) Words spelt the same, but accented and used differently, *e.g.*, *présent, presént.*
One is a verb, the other a noun.

(*g*) Words with silent letters, such as *gnarl* and *thumb.*
State the rules.

(*h*) Words ending in the sound of '*-shun*' are generally spelt with *-tion* (*-sion, -cion*).

The four ways of teaching spelling are :—
1st. PHONETICALLY,
2nd. ARBITRARILY, by appealing to the
(a) *Eye*, (b) *Accent*, (c) *Meaning*, (d) *Grammatical use.*

Geography.

1. Describe the climate and productions of Ceylon and Jamaica.

Ceylon—Where low-wooded tracts and flat marshy lands abound, covered with a rank luxuriant vegetation, the climate is eminently insalubrious. The heat is not so great as on the neighbouring coast of India, the sea-breezes moderating the temperature.

The east part of the island being exposed to the north-east monsoon has a hot and dry climate, resembling that of the coast of Coromandel; while the west division, being open to the south-west monsoon, has a temperate and humid climate like that of the Malabar coast.

The quantity of rain that falls annually in Ceylon is estimated at three times the quantity that falls in England, the rains being less frequent but more heavy.

The chief vegetable productions are coffee, cinnamon, cocoa-nuts, and rice. Metals are not abundant, but precious stones are found in considerable quantities. There is a celebrated pearl-fishery in the Gulf of Manaar.

Jamaica.—The climate of Jamaica is hot, but less so than most countries in the same latitude. Kingston registers 80°, and the minimum in winter on Blue Mountains is 44°. Jamaica as a whole is healthy, but fever is prevalent along the coast. There are two rainy and two dry seasons. The greatest rainfalls are in May and October, and last each three weeks, the amount descending varying greatly in different parts, viz., from 50 to 150 inches.

The minerals of the island are rather scarce, but the forests are extensive and contain many and various valuable trees. The sugar cane is very largely grown. The principal exports are sugar, coffee, rum, pimento, ginger, and timber. The cocoa-nut tree, bread-fruit tree, orange, plantain, and other tropical fruit trees abound.

2. Name the productions of three of the various tropical lands under British rule.

Upon looking at the map of the world we find that, taking into consideration the different continents, our three typical tropical territories are British Guiana, Gold Coast Colony, and the Straits Settlements.

British Guiana produces cotton, coffee, sugar, rum, molasses, rice, and a considerable amount of valuable timber.

From the *Gold Coast* we get gold, ivory, gum, monkey-skins, and palm-oil.

The *Straits Settlements* supply us with tin, sugar, pepper, nutmegs, sago, rice, buffalo-hides and horns, rattans, gutta-percha, gambier, gum, coffee, opium, cotton, silks, cocoa-nut oil, tea, and tapioca.

3. Draw a map of the basins of the Seine and Loire *or* of the Spanish Peninsula.

[See any respectable atlas.]

4. Explain the terms :— Meridian, Tropic, and Arctic Circle. What is the interval between noon at London and at places in 30° and 175° E. Long., and in 30° and 175° W. Long., respectively?

Meridians are great circles of the earth supposed to be drawn through both poles and to cross the equator at right angles (in two points).

Tropic is the name given to the parallel of latitude 23½° north or south of the equator, which is the extreme distance where the sun in his apparent annual path is vertical at noon. The sun appears to journey year by year backwards and forwards from the northerly Tropic of Cancer to the southerly Tropic of Capricorn. The word 'Tropic' means a turning.

The *Arctic Circle* is a parallel of latitude 23½° from the North Pole. It is the southern boundary of the North Frigid Zone, and at mid-winter in the Northern Hemisphere is completely out of the direct influence of the sun's rays.

When it is noon at London 30° E. Long. it is 2 o'clock p.m., 175° E. Long. it is 20 minutes to 12 p.m., at 30° W. Long. 10 o'clock a.m., and at 175° W. Long. it is 20 minutes past 12 p.m.

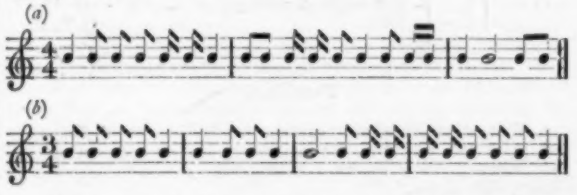
5. Describe the positions of Madrid, Berlin, Cracow, Naples, Simla, Madras, Lucknow, and Delhi.

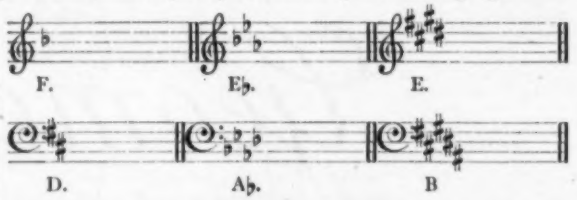
PLACE.	MATHEMATICAL POSITION. LATITUDE.	LONGITUDE.	TOPOGRAPHICAL POSITION.
Madrid	40° 24′ N.	3° 43′ W.	On the Manzanares, a tributary of the Tagus.
Berlin	52° 13′ N.	13° 24′ E.	On the Spree, a tributary of the Oder.
Cracow	50° 3′ N.	19° 52′ E.	On the Vistula in Austrian Poland.
Naples	40° 51′ N.	14° 15′ E.	On the Bay of Naples in S.W. Italy.
Simla	31° 6′ N.	77° 49′ E.	Nearly 200 miles direct north of Delhi.
Madras	13° 4′ N.	80° 14′ E.	On the Coromandel coast.
Lucknow	26° 55′ N.	80° 40′ E.	On the Goomtee in the province of Oude.
Delhi	28° 40′ N.	77° 16′ E.	On the Jumna, a tributary of the Ganges.

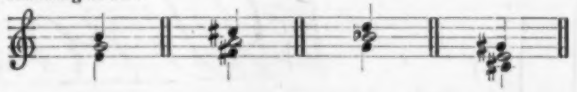
Music.

STAFF NOTATION.

1. Add bars to the following in accordance with the time-signatures:



2. State what major keys are shown by the following signatures:

3. Add a major third above and a minor third below each of the following notes:



TONIC SOL-FA NOTATION.

1. (*a*) Which are the strong or pillar tones of the scale, and (*b*) which tones have the greatest leaning tendency?

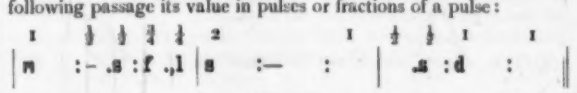
(*a*) **d** **m** and **s**. (*b*) **f** and **t**.

2. Between which tones of the common major scale are the following intervals found (*a*) major sixths, and (*b*) minor sevenths?

(*a*) *doh* and *lah*.
ray and *te*.
fah and *ray*^{1}.
soh and *me*^{1}.

(*b*) *ray* and *doh*^{1}.
me and *ray*^{1}.
soh and *fah*^{1}.
lah and *soh*^{1}.
te$_1$ and *lah*.

3. Write (in figures) distinctly over each note and rest in the following passage its value in pulses or fractions of a pulse:



(The remainder of Pupil Teachers' Answers and Science Answers will appear in our next issue.)

LONDON MATRICULATION.

January, 1892.

OUR PREPARATION CLASS FOR PRIVATE STUDENTS.

BY T. RUSSELL MALTBY, M.A. (CLASSICAL HONOURS),

Kingswood School, Bath.

THE London Matriculation Examination is not an easy one, and in beginning our Preparation Class we are compelled to assume that candidates have already more than an elementary knowledge of most of the subjects required. There are six clear months before the next examination, and that time, though sufficient for the work, must be fully devoted by students of ordinary attainments to *direct* preparation for the papers to be set next January. The advice offered month by month in these columns will be designed to meet the requirements of candidates of *average* attainments. If any of our readers find that our demands upon their time and powers are too severe, they must believe that their scholarship is below the mark, and endeavour by immediate and persistent study to acquire the sound preliminary knowledge which is a necessary foundation for a Matriculation course.

General advice as to methods of study, and even detailed rules as to the student's manner of life, have been given by Dr. Beach in *The Practical Teacher* for March, 1890. To these we refer our readers, and for the present urge upon them this counsel only:—Begin the course here laid down *at once*, and let each month's work be carefully and methodically done *up to time*. To those who will promise that this shall be so until December, we venture to promise triumphant results in January.

A copy of the Regulations for Matriculation may be obtained, post free, from the Registrar (Univ. of London, Burlington Gardens, London, W.). Constant reference should be made to these. For the present we do not advise candidates to spend time in scanning former examination papers.

I. IN LATIN there are two papers to prepare for. The requirements may be classified thus—

(1) Cæsar. Gallic War, V. and VI.
(2) Translation at sight.
(3) Grammar.
(4) Translation of English sentences into Latin.

Text Books.—We shall use the following in our class:—

(1) Cæsar. Gallic War, V. and VI., by Colbeck (Macmillan, 2 vols., 3s.).

(2) Allen's Elementary Latin Grammar (Clarendon Press, 2s. 6d.).

(3) Allcroft & Haydon's Latin Composition and Syntax (Clive & Co., 2s. 6d.).

Students will also require

(4) A book of easy extracts from Latin authors for practice in translation at sight.*

(5) A Latin Dictionary (Smith's, 7s. 6d., White's, 3s. 6d., or Gepp and Haigh's, 2s. 6d.). A Classical Dictionary and a good Classical Atlas should be within reach. 'Keys' are a necessity to some private students, and with an earnest appeal for a wise and sparing use of them, we recommend Mr. Nesbitt's Translations of Cæsar, V. & VI. (Clive & Co., 1s. each), and the key to Allcroft & Haydon's book (Clive & Co., 2s. 6d.).

Latin Course for July.

1. Allen's Grammar, Sects. 1–37. (Revision of Nouns, Adjectives, and Pronouns.)

Points such as 'Nouns like puer,' 'Nouns in -ius,' 'Rules for genitive plural,' the whole of page 12, and sects. 35–37 should be mastered at once and marked in the margin for constant revision.

2. Allen, Sects. 38–58.—Test your knowledge of the Regular Verbs by writing down Latin forms for 'Let them be loved,' 'Thou wilt be advised,' 'He must be ruled,' 'Ye might be heard,' &c. The *quantities* of the vowels are important. Mark the notes on 'Compounds of Sum,' and 'Verbs in -io,' the forms (with meanings) of the Verb Infinite of Deponent Verbs (p. 65) and every word of p. 66.

3. Allen, Sects. 59–85.—The Anomalous Verbs must be known with absolute certainty. Ēdo (to be distinguished from ĕdo) is dear to the soul of an examiner. Sect. 60, once learnt, is of constant service. Sects. 74–80 are tiresome, but essential.

Our readers will be glad to know that the grammar portions for July are unusually heavy. The reason is obvious.

4. Allcroft & Haydon, Sections 1–55. Observe the instructions of the preface. Learn all but the simplest examples. Mark in the margin points that are new to you.

5. Allcroft & Haydon, Exercises I. and II. (contemporaneously with A. and H., Chapters I. and II.). Students should give themselves abundant practice in turning sentences into Latin. Learn the vocabulary before beginning an exercise (this will be good preparation for unseen translation), revise your renderings the day after writing them, and then only refer to the Key. (See also A. and H.'s Preface.)

6. The work in Cæsar for July will be light. (1) Look up 'Julius Cæsar' in a Classical Dictionary or Roman History, or, in the volume 'Cæsar' (Blackwood's Ancient Classics for English Readers), the chapters on Books V. and VI. (2) Read rapidly any good English translation of Books V. and VI. (3) Lastly, with more care, study Mr. Colbeck's Introduction to Book V., begin your lists of geographical names (ancient and modern), and prepare a map in which to fill in these names.

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IN GREEK the requirements may be classified thus:—

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(2) Grammar.
(3) Translation at sight.

Text Books.—We shall use the following:—

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(3) Liddell and Scott's Lexicon (Clarendon Press, 7s. 6d.).

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Greek Course for July.

1. Abbott and Mansfield, Sects. 32—100. Accentuation is not essential. Note the *stems* of all nouns and adjectives. Mark paragraphs such as the observation on nouns like πατήρ. Sects. 74 to 82 are exceedingly useful. Sects. 99 and 100 should be learnt again and again.

2. Merry, 'Plan of Odyssey,' pp. xix. and xx.

By way of relaxation, candidates would enjoy a rapid reading of 'Homer' in Blackwood's Series above-mentioned, and an English translation of Odyssey, IV.

3. *Merry. Sketch of Principal Homeric Forms, Sects.* 1–15. Homer's Epic Forms are a great difficulty at first. There is nothing for it but a minute study of Merry's 'Sketch.' For this month learn to the end of Pronouns, and test your knowledge by attempting to account for the Epic Forms (except the verbs) in IV., 1—154. This will be enough for the month. Homer is easy to translate if the beginnings have been thorough.

* If one must be purchased, we recommend Smith's Principia Latina, part II., 3s. 6d.

(*e*) Derivatives which drop a letter of the root. *e.g.*, *love, loving.* Give the rule.

(*f*) Words spelt the same, but accented and used differently, *e.g.*, *présent, presént.*
One is a verb, the other a noun.

(*g*) Words with silent letters, such as ***gnarl*** and *thumb.*
State the rules.

(*h*) Words ending in the sound of '*-shun*' are generally spelt with *-tion* (*-sion, -cion*).

The four ways of teaching spelling are :—
1st. PHONETICALLY,
2nd. ARBITRARILY, by appealing to the
(a) *Eye*, (b) *Accent*, (c) *Meaning*, (d) *Grammatical use.*

Geography.

1. Describe the climate and productions of Ceylon and Jamaica.

Ceylon—Where low-wooded tracts and flat marshy lands abound, covered with a rank luxuriant vegetation, the climate is eminently insalubrious. The heat is not so great as on the neighbouring coast of India, the sea-breezes moderating the temperature.

The east part of the island being exposed to the north-east monsoon has a hot and dry climate, resembling that of the coast of Coromandel; while the west division, being open to the south-west monsoon, has a temperate and humid climate like that of the Malabar coast.

The quantity of rain that falls annually in Ceylon is estimated at three times the quantity that falls in England, the rains being less frequent but more heavy.

The chief vegetable productions are coffee, cinnamon, cocoa-nuts, and rice. Metals are not abundant, but precious stones are found in considerable quantities. There is a celebrated pearl-fishery in the Gulf of Manaar.

Jamaica.—The climate of Jamaica is hot, but less so than most countries in the same latitude. Kingston registers 80°, and the minimum in winter on Blue Mountains is 44°. Jamaica as a whole is healthy, but fever is prevalent along the coast. There are two rainy and two dry seasons. The greatest rainfalls are in May and October, and last each three weeks, the amount descending varying greatly in different parts, viz., from 50 to 150 inches.

The minerals of the island are rather scarce, but the forests are extensive and contain many and various valuable trees. The sugar cane is very largely grown. The principal exports are sugar, coffee, rum, pimento, ginger, and timber. The cocoa-nut tree, bread-fruit tree, orange, plantain, and other tropical fruit trees abound.

2. Name the productions of three of the various tropical lands under British rule.

Upon looking at the map of the world we find that, taking into consideration the different continents, our three typical tropical territories are British Guiana, Gold Coast Colony, and the Straits Settlements.

British Guiana produces cotton, coffee, sugar, rum, molasses, rice, and a considerable amount of valuable timber.

From the *Gold Coast* we get gold, ivory, gum, monkey-skins, and palm-oil.

The *Straits Settlements* supply us with tin, sugar, pepper, nutmegs, sago, rice, buffalo-hides and horns, rattans, gutta-percha, gambier, gum, coffee, opium, cotton, silks, cocoa-nut oil, tea, and tapioca.

3. Draw a map of the basins of the Seine and Loire *or* of the Spanish Peninsula.

[See any respectable atlas.]

4. Explain the terms :— Meridian, Tropic, and Arctic Circle. What is the interval between noon at London and at places in 30° and 175° E. Long., and in 30° and 175° W. Long., respectively?

Meridians are great circles of the earth supposed to be drawn through both poles and to cross the equator at right angles (in two points).

Tropic is the name given to the parallel of latitude 23½° north or south of the equator, which is the extreme distance where the sun in his apparent annual path is vertical at noon. The sun appears to journey year by year backwards and forwards from the northerly Tropic of Cancer to the southerly Tropic of Capricorn. The word 'Tropic' means a turning.

The *Arctic Circle* is a parallel of latitude 23½° from the North Pole. It is the southern boundary of the North Frigid Zone, and at mid-winter in the Northern Hemisphere is completely out of the direct influence of the sun's rays.

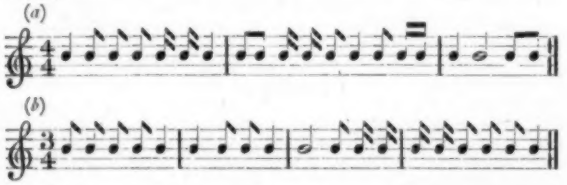
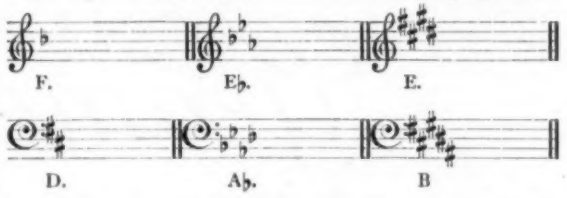
When it is noon at London 30° E. Long. it is 2 o'clock p.m., 175° E. Long. it is 20 minutes to 12 p.m., at 30° W. Long. 10 o'clock a.m., and at 175° W. Long. it is 20 minutes past 12 p.m.

5. Describe the positions of Madrid, Berlin, Cracow, Naples, Simla, Madras, Lucknow, and Delhi.

PLACE.	MATHEMATICAL POSITION. LATITUDE.	LONGITUDE.	TOPOGRAPHICAL POSITION.
Madrid	40° 24′ N.	3° 43′ W.	On the Manzanares, a tributary of the Tagus.
Berlin	52° 13′ N.	13° 24′ E.	On the Spree, a tributary of the Oder.
Cracow	50° 3′ N.	19° 52′ E.	On the Vistula in Austrian Poland.
Naples	40° 51′ N.	14° 15′ E.	On the Bay of Naples in S. W. Italy.
Simla	31° 6′ N.	77° 49′ E.	Nearly 200 miles direct north of Delhi.
Madras	13° 4′ N.	80° 14′ E.	On the Coromandel coast.
Lucknow	26° 55′ N.	80° 40′ E.	On the Goomtee in the province of Oude.
Delhi	28° 40′ N.	77° 16′ E.	On the Jumna, a tributary of the Ganges.

Music.

STAFF NOTATION.

1. Add bars to the following in accordance with the time-signatures:

2. State what major keys are shown by the following signatures:

3. Add a major third above and a minor third below each of the following notes:

TONIC SOL-FA NOTATION.

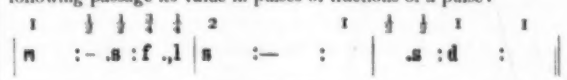
1. (*a*) Which are the strong or pillar tones of the scale, and (*b*) which tones have the greatest leaning tendency?

(*a*) **d m** and **s**. (*b*) **f** and **t**.

2. Between which tones of the common major scale are the following intervals found (*a*) major sixths, and (*b*) minor sevenths?

(*a*)	(*b*)
doh and *lah*.	*ray* and *doh*^{1}.
ray and *te*.	*me* and *ray*^{1}.
fah and *ray*^{1}.	*soh* and *fah*^{1}.
soh and *me*^{1}.	*lah* and *soh*^{1}.
	te$_1$ and *lah*.

3. Write (in figures) distinctly over each note and rest in the following passage its value in pulses or fractions of a pulse:



(The remainder of Pupil Teachers' Answers and Science Answers will appear in our next issue.)

LONDON MATRICULATION.

January, 1892.

OUR PREPARATION CLASS FOR PRIVATE STUDENTS.

BY T. RUSSELL MALTBY, M.A. (CLASSICAL HONOURS),

Kingswood School, Bath.

THE London Matriculation Examination is not an easy one, and in beginning our Preparation Class we are compelled to assume that candidates have already more than an elementary knowledge of most of the subjects required. There are six clear months before the next examination, and that time, though sufficient for the work, must be fully devoted by students of ordinary attainments to *direct* preparation for the papers to be set next January. The advice offered month by month in these columns will be designed to meet the requirements of candidates of *average* attainments. If any of our readers find that our demands upon their time and powers are too severe, they must believe that their scholarship is below the mark, and endeavour by immediate and persistent study to acquire the sound preliminary knowledge which is a necessary foundation for a Matriculation course.

General advice as to methods of study, and even detailed rules as to the student's manner of life, have been given by Dr. Beach in *The Practical Teacher* for March, 1890. To these we refer our readers, and for the present urge upon them this counsel only:—Begin the course here laid down *at once*, and let each month's work be carefully and methodically done *up to time*. To those who will promise that this shall be so until December, we venture to promise triumphant results in January.

A copy of the Regulations for Matriculation may be obtained, post free, from the Registrar (Univ. of London, Burlington Gardens, London, W.). Constant reference should be made to these. For the present we do not advise candidates to spend time in scanning former examination papers.

I. IN LATIN there are two papers to prepare for. The requirements may be classified thus—

(1) Cæsar. Gallic War, V. and VI.
(2) Translation at sight.
(3) Grammar.
(4) Translation of English sentences into Latin.

Text Books.—We shall use the following in our class:—

(1) Cæsar. Gallic War, V. and VI., by Colbeck (Macmillan, 2 vols., 3s.).
(2) Allen's Elementary Latin Grammar (Clarendon Press, 2s. 6d.).
(3) Allcroft & Haydon's Latin Composition and Syntax (Clive & Co., 2s. 6d.).

Students will also require

(4) A book of easy extracts from Latin authors for practice in translation at sight.*
(5) A Latin Dictionary (Smith's, 7s. 6d., White's, 3s. 6d., or Gepp and Haigh's, 2s. 6d.). A Classical Dictionary and a good Classical Atlas should be within reach. 'Keys' are a necessity to some private students, and with an earnest appeal for a wise and sparing use of them, we recommend Mr. Nesbitt's Translations of Cæsar, V. & VI. (Clive & Co., 1s. each), and the key to Allcroft & Haydon's book (Clive & Co., 2s. 6d.).

Latin Course for July.

1. Allen's Grammar, Sects. 1–37. (Revision of Nouns, Adjectives, and Pronouns.)

Points such as 'Nouns like puer,' 'Nouns in -ius,' 'Rules for genitive plural,' the whole of page 12, and sects. 35–37 should be mastered at once and marked in the margin for constant revision.

2. Allen, Sects. 38–58.—Test your knowledge of the Regular Verbs by writing down Latin forms for 'Let them be loved,' 'Thou wilt be advised,' 'He must be ruled,' 'Ye might be heard,' &c. The *quantities* of the vowels are important. Mark the notes on 'Compounds of Sum,' and 'Verbs in -io,' the forms (with meanings) of the Verb Infinite of Deponent Verbs (p. 65) and every word of p. 66.

3. Allen, Sects. 59–85.—The Anomalous Verbs must be known with absolute certainty. Ēdo (to be distinguished from ĕdo) is dear to the soul of an examiner. Sect. 60, once learnt, is of constant service. Sects. 74–80 are tiresome, but essential.

Our readers will be glad to know that the grammar portions for July are unusually heavy. The reason is obvious.

4. Allcroft & Haydon, Sections 1–55. Observe the instructions of the preface. Learn all but the simplest examples. Mark in the margin points that are new to you.

5. Allcroft & Haydon, Exercises I. and II. (contemporaneously with A. and H., Chapters I. and II.). Students should give themselves abundant practice in turning sentences into Latin. Learn the vocabulary before beginning an exercise (this will be good preparation for unseen translation), revise your renderings the day after writing them, and then only refer to the Key. (See also A. and H.'s Preface.)

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IN FRENCH, candidates must prepare for a long paper. The requirements in brief are :—

(1) Translation into English.

(2) Grammar, limited to the Accidence.

Text Books.—

(1) Smith's Principia, part II. (4s 6d.), is a useful book, containing numerous prose extracts of graduated difficulty, timely grammatical questions, varied notes, and a generous vocabulary (with etymologies). But we do not advise our readers to confine themselves to one translation-book.

(2) Breymann's French Grammar based on Philological Principles (Macmillan, 4s. 6d.).

(3) A Dictionary (Contanseau's, 3s. 6d., or Cassell's, 3s. 6d.).

(4) Matriculation French Papers (Clive & Co., 1s.).

French Course for July.

1. Write out, in the most careful manner, translations of the extracts set in the first four papers (Text Book [4])—one paper in each week. Students should put their best work into these versions, and preserve them.

2. Translate more rapidly about six pages a week from some such book as (1) above.

3. Compile steadily in the course of your reading lists of words with their meanings. A copious vocabulary is absolutely necessary. Compile in the same way lists of *phrases* met with in Dictionary or notes. Revise these lists repeatedly.

4. *Breymann, to the end of the Second Conjugation* (fuir and vêtir). In Part First (Phonology), much time need not be spent on IV. (Pronunciation), or VI. (Junction of words). VII. (Use of Capitals) is important. The Table of Derivation of the Tenses, once learnt, will deliver the student from many perplexities. In French Verbs nothing must be missed.

III. IN ENGLISH there are two Papers to prepare for :—

(1) On 'The General History and Grammatical Structure of the Language.'

(2) On 'The History of England to the end of the seventeenth century, with the Geography relating thereto.' The regulations contain an impressive 'N.B.' 'Special stress is laid on correct spelling and grammar in the answers to the questions.'

The London papers on English language are notorious. Candidates must prepare for the examiners as for deadly enemies. They must from the first resign many laborious hours to English studies, both wide and deep. After about three months they should devote an occasional half-hour to a perusal of papers set at former examinations.

Text Books.—In our class-work we shall use—

(1) Dr. Beach's 'Elements of English' (Joseph Hughes, 3s. 6d.), but in this subject no single book is sufficient. Morris's Primer (Macmillan, 1s.) is invaluable. Hewitt and Beach's 'Manual of Our Mother Tongue' is the most complete book we know, but it is expensive (7s. 6d.). Mason's English Grammar (Bell, 3s. 6d.) deals with some of the more difficult problems in a masterly way.

(2) English Language Papers (Clive and Co., 1s.). This will not be required by those who possess the 'Manual' above-mentioned.

(3) Ransome's Short History of England (Rivington's, 3s. 6d.), and, for those who do not make their own outlines,

(4) Curtis's Outlines of English History (Simpkin, 6d.) We have found Acland and Ransome's Handbook in Outline (Rivington's, 6s.) most helpful.

English Course for July.

1. *Beach*, pp. 1—52.—London candidates should give prolonged attention to all questions concerning the *alphabet*. The repeated lists of 'derivations' are well-conceived. Mark all definitions. Make notes on the etymology of most of the words on pp. 22, 37 and 38, and of *all* pronominal forms. Master the history of reflexives. Construct other classifications of the prononns.

2. Regular practice in analysis of sentences (pp. 128—139).

3. English History (Ransome) to 1066, *with the Geography relating thereto.*

IV. IN MATHEMATICS there are two Papers :—

(1) Arithmetic and Algebra ;

(2) Geometry.

We hope that many of our readers will set themselves to 'punish' the first paper severely. They will have an opportunity, without any disproportionate outlay of time, to secure a high percentage of marks and retrieve possible misfortunes in other papers. 'Pluck' avails more in answering questions in Mathematics than in dealing with—say, Latin Grammar. There are multitudes of good books in Mathematics. We shall refer in our class to the following :—

Text Books.—

(1) Capel's Handbook of Arithmetic (Hughes, 2s. 6d.), for systematic review and practice. The 'Answers' contain 'occasional hints' as to the working of the examples.

(2) Capel's 'Catch Questions in Arithmetic' (Hughes, 4s. 6d.) is written with the special object of showing how problems may be solved and awkward questions answered.

(3) Capel's 'Handbook of Algebra' (Hughes, 2s. 6d.).

(4) Capel's 'Tips in Algebra' (Hughes, 4s. 6d.).

(5) Euclid, Books I.—IV., by Hall and Stevens (Macmillan, 3s.).

Mathematical Course for July.

1. *Text Book* (1), *Part III.*—Vulgar Fractions.—Work out only the most difficult examples.

2. *Text Book* (2), *Chapters I. to V.*—It ought not to be necessary for Matriculation candidates to give more than an hour or two a week to Arithmetic.

3. *Text Book* (3), *Chapters I. to XVIII.*—Students must practise writing down squares and products, remainders and quotients (xi. to xiv.), until they gain complete facility, and if they have 'liberty' in factors (xv. to xvii.), we predict that they will have a free course through the remaining parts.

4. *Text Book* (4), *Chapters I. to VII.* should be read in connection with those last mentioned. Here will be found further hints on factors, and many neat methods of abridged working. For the Paper in Arithmetic and Algebra, the requirements are accuracy, speed, and *style*. The two first come by nature and practice, the third chiefly by example. Text Books (2) and (4) should be closely studied for specimens of neat method.

5. *Text Book* (5), pp. 1–86.—Revise Euclid, Bk. I., and work copious exercises after Proposition 21. *Cultivate style.* Ten questions are usually set by the examiners. Much distress is usually felt by the examinees.

V. MECHANICS.—The requirements are—

(1) General acquaintance with apparatus.

(2) Mechanics.

(3) Hydrostatics.

The subject will be new to most candidates. It is particularly interesting, but in parts very difficult for beginners. They must not read in the 'plodding' temper, but keep their minds on the alert.

Text Books.—

(1) Magnus's Mechanics (Longmans', 3s. 6d.).

(2) Hamblin Smith's Hydrostatics (Rivington's, 3s.).

Course in Mechanics for July.

Magnus, pp. 1–57, *Kinematics.*—This is the easiest part of the subject. Observe the regulation concerning 'elementary notions as to velocity, acceleration,' &c. Commit to memory all *definitions and formulæ*. The methods by which a general formula is established should always be thoroughly

mastered. In Chapter I., 'Resolution of Velocity' is perhaps the real *crux*. In Chapter II., a definition of '*g*' should be prepared. Attempt most of the exercises, and do not be discouraged by failures after the first reading. Some knowledge of Algebra is indispensable. Those who can should not hesitate to employ Trigonometry.

VI. The sixth subject is *one* of four branches of Science, viz., (1) Chemistry; (2) Heat and Light; (3) Magnetism and Electricity; (4) Botany. We propose to take up *two*, viz., *Chemistry* and *Heat and Light*, in these columns. It must be clearly understood that no credit will be given for more than *one* of the subjects given under Section VI.

CHEMISTRY.—We cannot conduct experiments, even in the *Practical Teacher*, but our readers must arrange to see experiments somewhere. In Chemistry a practical teacher is almost a necessity, and it is only subject to his approval that we prescribe as follows:—

Text Book.—

Morris's Class Book of Inorganic Chemistry (Philip and Son, 2s. 6d.). The subject is presented very clearly, but the whole Matriculation course is not covered. Another useful Chemistry is Kemshead's (Collins, 2s.).

Course for July.

Morris.—Introduction, Oxygen, Hydrogen, and Compounds of Oxygen and Hydrogen. The paragraphs on Water meet the requirements of the regulations exactly.

HEAT AND LIGHT.—We should advise many candidates to elect to be examined in this subject, if for no other reason than that a satisfactory text-book is procurable.

Text Book.—

'Heat and Light,' by R. W. Stewart (Clive and Co., 3s. 6d.).

Course for July.

Chapters I. to IV.—Mark these paragraphs: 'Construction of Thermometer,' 'Sources of Error in Mercurial Thermometer,' and 'Co-efficient of Expansion.' The 'Calculations' should be carefully studied, and all the examples attempted.

(*To be continued.*)

—o—

CONVERSATIONAL SCIENCE LESSONS.

BY DR. ROBERT STEELE, B.SC. F.C.S.

INTRODUCTION.

THERE can be no better introduction to this course of lessons than the following words of the Code:—

'It is intended that the instruction in elementary science shall be given mainly by experiment and illustration. If these subjects are taught by definition and verbal description, instead of by making the children exercise their own powers of observation, they will be worthless as means of education. The examinations of the Inspectors will be directed so as to elicit from the scholars, as far as possible in their own language, the ideas they have formed of what they have seen.'

A feature of these lessons is that they do not make the usual demands on the time of the teacher for their preparation. There must of course be some time spent (the author finds usually half the time of the lesson in the case of a new lesson), but some otherwise valuable courses are spoilt by the excessive demands made on the teacher, who is often unaided. In one most useful set of lessons 35 objects are required for a single lesson; in another, 20 specimens are to be procured to teach certain differences. A well-found school, with intelligent and trained boys to assist, will easily obtain such, but it is the small school, and the boys of stunted intelligence, that most require object teaching.

The author has therefore tried to keep down the requirements of apparatus, to use apparatus again and again till it is familiar, and to show but one main experiment in a lesson. After long experience in science teaching, he makes it a rule never to tell a boy anything that he can possibly find out for himself, but to repeat an experiment three or four times if necessary to let him observe it. The most that a teacher should allow himself is to gather up the facts observed, and to direct the attention of the class to the question which the experiment is to answer. Lastly, too much stress cannot be laid on constant recapitulation, and incessant use of the blackboard.

LESSONS.

COURSE F., STANDARD II.

1. THE AIR. Some properties of gases.
2. WATER. Some properties of liquids.
3. ICE. Some properties of solids.
4. THE EFFECT OF HEAT ON AIR.
5. EFFECT OF HEAT ON WATER.
6. EFFECT OF HEAT ON SOLIDS.
7. A CANDLE. How heat is produced.
8. A FIRE.
9. A RED HOT POKER.
10. BOILING WATER, cooling, &c.
11. CLOTHES, prevent cooling.
12. SUNLIGHT.
13. REFLECTION OF LIGHT.
14. SHADOWS.
15. A MODEL CAMERA.
16. A PRISM.
17. RED.
18. BLUE.
19. YELLOW.
20. PAINTS.
21. A POND. Simple lesson on refraction.
22. A BURNING GLASS.
23. THE RAINBOW.
24. A BELL.
25. A TOY TELEPHONE.
26. A TUNING FORK.
27. A WHISTLE.
28. A VIOLIN.
29. AN EAR TRUMPET.
30. AN ECHO.

LESSON I.—THE AIR.

Summary.—(To show some properties common to gases.) Air surrounds us. It cannot be seen, but it can be felt and heard. It fills all vessels usually said to be empty. It can be pressed smaller.

Materials.—A slate, glass jar of water, small tumbler or wine glass, corked glass bottle, glass funnel, hollow rubber ball.

Introduction.—How do we know that we have arms? By feeling. How do we know of the table, sound, sweetness, scents, &c.? By sight, hearing, taste, smell. Name something we know of by sight only, by hearing only, by feeling only? By judicious questioning in this way the teacher will get from the class that we can feel the air though we cannot see it, &c.

I. Take the slate and wave it edgewise. It moves easily. Wave it fanwise. It moves less easily. Why? It has to move the air out of the way. Can you feel the air getting out of the way? Get other cases of this sort, *e.g.*, the wind felt in driving, running, draught in a railway carriage, &c.

II. If air is everywhere it is in so called empty vessels. Take up the ball in your hand, and ask what is in it. Some will say 'nothing,' others 'air.' Squeeze the ball in the direction of a boy's hand. Did anything come out? What? Air. Then there was air in it, though some said there was nothing.

III. We will show this in another way. Here is an 'empty' glass. Invert it in water. The water does not go in. Why? Because the glass is full of air. Push

the tumbler to the bottom of the jar. Some water enters the glass. Has any air got out? No. What has happened? The water has squeezed the air tighter together.

IV. Why did the water not go into the glass just now, and go into it now (when the glass is sunk below the water)? The air can get out. Take a corked bottle (a medicine bottle will do), put a funnel through the cork (fitting tightly). What is the use of a funnel? To avoid spilling. Pour water into the funnel. Nothing enters the bottle but a few drops. How is this? No air can get out. Let the air out by raising the cork; the water at once rushes in. Note, a little water got in; how was that? Because the water squeezed the air smaller.

Recapitulate.

Experiment IV. can be performed without a cork more effectually by putting a little soap round the neck of the funnel to make it fit the bottle.

Lesson II.—Water.

Summary.—A liquid has a definite surface, which is always level. It is easily displaced. It has no shape of its own, but completely fills the part of the vessel in which it is. It can be poured from one vessel to another. It runs from a higher to a lower level. It wets substances.

Materials.—A glass of water, a pebble, a cork, a piece of wood, the hollow ball, the funnel, some paraffin oil, and some olive, colza, or linseed oil in bottles, and a plate of sand.

Introduction.—What is this? A glass of water. How do you know that? How do you know it is not sand, for example? By seeing. You could *see* sand, could you not? In this way arrive at the fact that there are certain obvious differences between sand and water or oil, and certain likenesses between water and oil. These we will examine.

I. Note the surface of the water. It is always smooth. The same is true for oil. Can you keep the surface uneven in any way? Try. Can you keep the surface of the sand uneven? First difference.

II. Tilt the glass of water and oil bottles in succession. The surface is still smooth. It is level with something. Draw a line level with the surface on the blackboard before tilting. Show that the surface keeps the same level on tilting. The surface is level with the floor. Move the sand in the same way. Second difference.

III. Put the pebble on the sand. It remains on the top. Put it on the water. The water moves out of the way and the pebble falls. Put in the wood, some water moves out of the way. Put in the cork, less moves out of the way. The water is much more easily displaced than the sand. Third difference.

IV. It has no shape of its own. Build up a pyramid of sand. It has a shape. Point to the cork, wood, &c. Each has its own shape. What shape is each? What shape is the water? The oil? The shape of what it is in. Fourth difference.

V. Build up a slanting surface of sand on a slate. It remains. If the sand were water what would happen? If it were oil? It would come level. No, that will not do. What comes? The water from the higher level runs down. When does it stop? When it reaches the edges and is turned back. Fifth difference.

VI. Pour water from one glass to another a little at a time. If the water were a solid in one lump could we do this? No. Why? It must all come together.

The teacher will now point out that all these things are true of any liquid, and will give them the name liquid.

Recapitulate.

(To be continued).

—o—

PUZZLE COLUMN.

A Prize of a Half-Sovereign will be given each month for the best answer to the Puzzle set for Competition.

In making the award, account will be taken of critical, literary, poetic, or artistic skill displayed in the answers.

The Editor reserves the right to divide the Prize between two or more competitors, and his decision must be considered final.

The real name and address of the successful competitor will be published in *The Practical Teacher*, together with the Prize solution.

Answers must be written on one side of the paper only, and sent in by the 12th of each month, addressed—

PUZZLE EDITOR,
The Practical Teacher,
Pilgrim Street,
Ludgate Hill, E.C.

DOUBLE ACROSTIC.

No. I.

1. A company, a goodly few, out on a journey set—
   I tell this tale, and I much bewail *the kind of fate they met.*
2. *B.A.'s, M.A.'s, F.R.G.S.'s*—honours meekly wearing—
   Of midnight oil, and midnight toil, never had they been sparing.
3. Their leader bore *a Russian name*, a mixture of choke and sneeze,
   And they sailed away in chase of the day o'er wild and stormy seas.
4. Their hearts sank down—their hearts rose up—they'd have jumped right out if they could,
   Till landed at last, their pilgrimage past, on *a mountain* top they stood.
5. *The mountain spoke*, not soft nor low, but with a gathering swell;
   The travellers heard, they said not a word, for they knew that sound full well.
6. They turned them back, *to walk* away, at such an easy pace
   As suited first-rate their dignified state, but not that time nor place.
7. Yet soon they ran at their utmost speed—needs must when Pluto drives;
   Headlong they went, though *fatigued and spent*, to save their precious lives.
8. And all in vain, they sink at last, *o'erwhelmed* by the falling rain
   Of ashes and scoriæ; they and their story e-vanish from sight and pain.

Take these eight equal lights, and in the initial letters find
A word which, though it stands in front, tells of what comes behind.
And in the finals something see—once a worry on childhood's page—
Which (don't you wish you may get it?) perchance may cheer and sustain your age.
Put not the two together; though two *may* be joined in one,
The result in this case would certainly be—there would precious soon be none.

RECITATIONS FOR YOUNG CHILDREN.

TIMES AND SEASONS IN RHYMES AND REASONS.

I.

Sixty seconds just make up a minute,
  Sixty minutes exactly an hour,
And how many hours do you think a day's in it?
  Twenty-four, of course, just twenty-four.
But, remember, whenever we say,
Twenty-four hours make up a day,
  The day and the night together are reckoned
  To the eighty-six thousand and four hundredth second!

II.

Next you've heard of a week.
  Well, a week has seven days—
Six our calling to seek,
  One for rest and God's praise,
That one day, that one day,
And the first of the week, is Sunday;
  Then Monday, Tuesday, Wednesday, Thursday,
Friday and Saturday, dears,
  Those are the six that for work we fix
Through the weeks and months and years.

III.

What's a month? do you ask me,
  I'm glad that you do,
For it shows you're attending,
  And interested too.
And the month's not so easy a time to explain,
But prick up your ears and I'll make it all plain.
  A fortnight's two weeks, and a lunar month four,
  With twenty-eight days, no less and no more;
For Luna, the moon, takes exactly that time
To course round the earth in her circuit sublime.

IV.

But the calendar months, all but February,
From the twenty eight days of the lunar months vary;
  'For thirty days have September,
  April, June, and November,
Seven of the rest have thirty-one,
February twenty-eight alone;
  Except in Leap-year, at which time
  February's days are twenty-nine."
And the calendar months in this order go
Year by year, as you all should know.
  January, February, March,
  Frost, rain, and winds that parch;
April, May, and June,
Flowers blow, and birds give tune;
  July, August, and September,
  Farmers their crops remember;
  October, November, December,
  Plough, sow, and stir the red ember!

V.

Then, how many calendar months have we here?
  Four with just thirty days, *seven* with just thirty-one,
One with twenty-eight days, twenty-nine each *fourth* year.
  Why, we've twelve, and twelve months make one year,
  by the sun.
    By the sun! How is that?
    Well, the earth is not flat,
  But round, like an orange;
    And wise men have found
  That not only it *is*,
    But always *goes* round!

But does the sun move? Well, in one way it does.
  In one spot, like a splendid tee-totum 'tis twirled;
While round it the earth, without even a buzz,
  Like a wonderful whip top for ever is whirled.
It spins round on itself in the twenty-four hours,
Like a peg-top asleep, does this round world of ours;
  And it rolls round the sun, and the time that it takes
To go all the way round is exactly a year—
  That's twelve months, and then twelve months make
    fifty-two weeks—
That's three hundred and sixty-five days, very near.

A. P. G.

RECENT INSPECTION: A VILLAGE SCHOOL.

THIS being our first experience under the New Code, our anxiety was naturally great. But the result was very satisfactory, and it was evident that the Inspector meant to give us fair play, and to encourage us by every means in his power to take advantage of the freedom, which was a privilege unknown to us under the old regime.

A few of the children were unfit for Standard I. These had been taught in a preparatory class during the year, and were entered on the schedule under the heading Standard 'o.' The Inspector satisfied himself that these had received proper attention, but the test was a short and easy one.

The examination then began in earnest. Half the children in each Standard were examined in writing, the other half in arithmetic. A large proportion of each Standard read.

Arithmetic.

STANDARD I.

1. 8 + 300 + 69 + 193 + 770.
2. 301 − 19.
3. 724 − 689.

Two sums right for a 'pass.' Some of the boys were questioned in tables. 'Nine fives' was given, 'eleven fours,' &c.; the reason is obvious.

STANDARD II.

1. 30,864 ÷ 8.
2. Multiply 5,809 by 769.
3. Take 15,804 from 16,012.
4. Add: 780, 64,012, 75,950, 808, 24,004, 6,766.

Tables were asked for. 11 × 9, 10 × 11, 12 × 8, 11 × 11, &c.

STANDARD III.

BOYS.

1. Add: £864 17s. 2½d., £94 0s. 11¾d., £5,026 2s. 6d., £384 19s. 5¼d., and £9 5s.
2. *From* three thousand six hundred and eighty-two pounds seventeen shillings and a penny *take* eight hundred and fifty-nine pounds and elevenpence halfpenny.
3. Divide 824,604 by 265.
4. I paid £3 5s. 8d. for a suit of clothes. The coat cost £1 12s. 6d., the waistcoat 14s. 8d. How much did the trousers cost?

GIRLS.

1. Add: £625 12s. 5¾d., £7 9s. 2½d., £930 0d. 7d., and £364 2s. 9¾d.
2. *From* five hundred and twenty-nine pounds and sevenpence three farthings *take* one hundred and eighty-nine pounds two shillings and elevenpence three farthings.
3. Divide 80,256 by 59.
4. A tailor made 56 boys' jackets. On each jacket he put 7 buttons. He bought 500 buttons. How many had he left?

STANDARD IV.

BOYS.

1. £8,369 13s. 4d. was paid for 238 horses; how much was that for one?
2. How many square feet in 6 acres 21 sq. yards?

3. How many pecks, &c., of oatmeal would be required to make thirteen thousand six hundred and thirty packets, each containing a pint?

4. I paid £14 6s. 4d. for 324 gallons of milk, and of this quantity 128 gallons cost me 10d. a gallon. How much altogether did I pay for the remainder?

GIRLS.

1. Divide £42 13s. 8¾d. by 43.
2. Bring 16 wks. 15 hrs. 52 mins. to minutes.
3. How much tea will be required to make up 3,714 parcels, each containing one pound?
4. How much can a woman save out of a yearly income of £65 if she spend 2s. a week in rent, 14s. a week in household expenses, and £15 a year in dress? (52 weeks 1 year.)

STANDARD V.

BOYS.

1. A draper gave in exchange for bacon at 8d. per lb. one coat worth 19s. and three vests at 5s. each. How many lbs. did he get?
2. 968 at £3 8s. 5d. each.
3. A man walks 5 miles 2 furlongs in 1 hour 40 minutes. How far will he walk in 4 hours 10 minutes?
4. *Bill.* 12 locks at 10d. each; 49 lbs. nails at £1 per cwt.; 14 lbs. nails at 2½d. per lb.; 500 screws at 9d. per score.

GIRLS.

1. If I give 2s. 1d. for 100 buttons, how many for £1 16s. 5½d.?
2. *Bill.* 11 loaves at 4¾d. each; 5½ pecks at 1s. 7d. per peck; 9¼ bushels at 3s. 6d. per bushel; 1½ cwt. at 1½d. per lb.
3. 6,009 at 5s. 8¼d. each.
4. ½, ⅛, ⅝, ¼. Add the least to the greatest.

STANDARD VI.

1. A man paid £130 12s. 6d. for a loan of £500 for 5½ years. Find rate per cent.
2. In 1878 72,355 people emigrated from England at the rate of 2·9 per 1,000. Find the population.
3. Add ·643, ·0075 and ·9744, and divide by ·032.
4. What fraction (vulgar and decimal) of 8s. 4d. is 1·75 of 2s. 6d.?

STANDARD VII.

1. I invest £1,700 in the 4 per cents. at 85. What is my income?
2. A land owner let three farms: 125 acres 2 roods; 250 acres 1 rood; and 375 acres 3 roods; at 25s., 30s., and 40s. respectively per acre. Find average price per acre.
3. Two trains start at 9.30 to meet each other, 250 miles apart one at the rate of 35½ miles per hour, and the other at the rate of 24½ miles per hour. What time do they meet?
4. A sells a knife to B so as to gain 25 per cent.; B sells it to C for 6s., gaining 20 per cent. Find what A paid for it?

Mental Arithmetic.

STANDARD I.

TABLES (THOROUGH EXAMINATION).

Add 9, 8 and 11. Take 2 dozen from 30. Take ½ a dozen from ½ a score. Take 3½d. from 6d. Add 2½d., 1½d. and 2d. I give 1½d. to each of 4 boys, what change from a shilling? How many fives in 40? 19 pence? 11 farthings?

STANDARD II.

I give 6 eggs to each of 6 women, how many left out of 40? How many nines in 63? Add seven eights to four tens. I spend 7s. 6d. out of £1, how much left? 95 pence? 89 pence? 110 pence? Divide 81 by 9, and take half a dozen from the answer. Add 3s. 6d. and 2s. 6d. The half of 6s. 9d.? 9 books at 4d. each? What must you add to 117 pence to make half a sovereign? Three pounds of butter at 1s. 4d. a lb.?

STANDARD III.

13 books at 2s. a dozen? How many half crowns in 30s.? A man earns 6s. 8d. a day, and his son half that amount; what do they earn altogether in two days? Take 2s. 1½d. from half a crown? 1s. 11½d. from 2s. 6d.? I save 2d. a day in April; how much do I save in the month? I earn £50 a year and spend £4 per month (12 months in a year); what do I save in a year? How many ounces in ½ lb.? How many feet in 2 yards? I pay 1s. 4d. for a pound of butter; how much for an ounce?

STANDARD IV.

How many feet in a pole? How many feet in a chain? 2½ lb. at 1d. an ounce? How much is a penny a day in leap year? Take 14s. 6d. from a guinea. A gallon of milk at 1½d. a pint? Take ¼ from ½. What is the fourth of £1? How many sixpences in £2? How many farthings in the difference between half a sovereign and half a guinea? What must I add to 6 half crowns to make £1? I earn 2s. 6d. a day for a fortnight; how much in all? (Exclude Sundays.) Take 1s. 11d. from a sovereign. What must I pay a man during the month of May at 5s. a day? (Reckon Sundays.)

STANDARDS V., VI., VII.

⅓, ¼, ⅝ written on the board. Add the greatest to the least. What is the difference between ¾ of £1 and ⅘ of £1? Multiply 87 by 25. ·5 of a guinea? How many times is 1½ contained in 12? Simple interest on £250 for 2 years at 4 per cent.? By how much does 2 exceed 1·25? Add ⅓ and ⅛. Take ⅜ from 2. Add ⅛ of £1 to the third of a crown. What fraction of £1 is 4s. 2d.? 1 square mile at 2s. 6d. per acre? 300 eggs at 5 for 6d?

Writing.

STANDARD I.

A line of print from one of the readers.

STANDARD II.

An easy piece of about six lines. Hardest words: contain, divide, running, busy.

STANDARD III.

A fair piece. Hardest words: separate, giant, continue, repeat, laughter.

STANDARD IV.

(From slip of paper brought by Inspector.) Hardest words: minute, rescue, obstinate.

In other Schools; warrior, interred, memorable, consistent, declaration, incessant, hospital, compelled, century, anxiety.

Composition.

STANDARD V.

I have a remarkably intelligent puppy. He was accustomed to lie, whenever he had the opportunity, on the sofa in the parlour. I frequently chastised him for this, but nothing seemed to cure him of the habit. Whenever the door was left open he would enter the room and run to his favourite resting place. On one occasion, shortly after a beating, he went to the servant's room, took up a small rug that was lying on the floor, and having placed it on the sofa took up his favourite position. He evidently thought my objection would be now removed. In a few moments he was sleeping the sleep of innocence.

STANDARD VI.

Write a letter to a friend describing your last holiday, *or* say what you know of any great sailor or soldier of whom you have read.

STANDARD VII.

Write an essay on Truth, Punctuality, or Spring.

Grammar.

STANDARD I.

Select nouns from the reading book. Children were asked to make simple sentences.

STANDARD II.

Select Nouns and Verbs from the reader. A few simple questions asked on the Noun. 'Play' came as a Verb; the Inspector asked the children to make a sentence with 'play' as a Noun.

STANDARD III.

Select the parts of speech from the reader. Children asked to make sentences with certain words given: such as *Bird* (The bird sings), etc.

STANDARD IV.

Questions asked first on the grammar. How many moods? tenses? Name them. Make a sentence with the verb in the imperative mood.

Parse 'give' in 'Give me a book.' The readers were in the children's hands. Certain words selected by Inspector and the parsing was asked for. Only easy words given. The test was a fairly easy one throughout.

STANDARDS V., VI., VII.

What is analysis? What is the chief word in a sentence? What can be the subject? Which is the enlargement of the subject in 'There are many men in the room?' Which is the direct object in 'Give me a book?' Parse and analyse: 'To err is human.'

Other examples taken from the Readers.

Geography.

A fair examination throughout. The plan of the room was taken thoroughly in Standard I. Children were called upon to show the positions of doors, master's desk, &c., on the plan.

In Standard II. a sketch of a river was drawn on the board, and tributary, bed, source, mouth, &c., asked for. Also general questions—such as valley, volcano, county, point, peak, &c.

Standard III. were first examined on map of the county. Nearest town? Largest river? Highest hill? Then questions on England. Six northern counties? What river separates England from Wales? Tributaries of that river? Towns standing on the river? Towns in the Isle of Wight? What do you know of Windsor? Reading? Stratford-on-Avon? Leicester? Newcastle-on-Tyne? Name the great manufactures. Is the woollen manufacture carried on elsewhere than in Yorkshire? Where are ribbons made? Boots and shoes? Flannel? Watches? Straw hats? Gloves? China? Knives? &c.

STANDARD IV.

General questions on Scotland, Ireland, and Canada. Manufactures, chief towns, &c.

STANDARDS V. AND VI.

Europe. Three maps drawn. Questions first on these (very thorough examination), then on Russia, Norway and Sweden (chief towns, lakes and occupations of the people). Chief rivers flowing into the Mediterranean (in order, starting from the east). Towns on Rhine? On Danube? What part of Germany belonged a few years ago to France? What was the name of the French Emperor who surrendered to the German Emperor at the close of the last war between France and Germany? What is the Iron Gate? the Golden Horn? the Manzanares? the Escurial? Great Belt? the Spree? Bohmer Wold? Perekop? Marmora? Bonifacio? &c. Productions of France? &c.

Music.

STANDARDS I. AND II.

Modulator—**d m d¹ s f m d r m s d¹ d¹ d.**

Time—

| 1 :1 | 1 :— | 1 :1 | 1 :1 | 1 :— | 1 :— ‖

STANDARDS III. AND IV.

On Board—**d m s f r d t_1 d l t d¹ r¹ d¹ f r d.**

| 1 :— |— :1.1 | 1 :— |1.1:1 | 1 :— |— :1 | 1 : | 1 : ‖

STANDARDS V., VI., AND VII.

Key D.—**d m s t_1 d s l s f m l t d¹.**

Key F.—**d m r d t_1 d m s ^{s}d¹ t d¹ r¹ d¹ t d¹ s l s d¹ ^{d}s f m r d.**

Minor A.—**l t d¹ t l se l l m r d r m l d¹ t l.**

| d :d | d :-.d | d.d :d.d | d :— | d :— | : | d :-.d | d :— ‖

Reading.

Fluency expected in every Standard. Meanings asked for in Standards 3-7, and a few simple questions on the subject matter were given in Standards 1 and 2. 'Previously unseen' readers were used with many of the children in Standards 4-7, and with a few in Standard 3, but the test was a very fair one, and the children did well. (Good practice had been provided during the year, papers, books, &c., being given to the children, and every encouragement held out to secure wide reading.)

Copy Books.

These were carefully examined in all classes, and the teacher's marks noticed. (Inspector expects marks to be awarded at the foot of each page.)

Order.

Carefully noticed, especially when the classes changed places, or when certain boys left the class to read.

General Results.

Inspector, teachers, and children all seemed happier under the new system. Less time was taken in the actual examination. 'A few failures here and there do not matter,' said the Inspector; 'I do not calculate percentages; I wish rather to encourage sound, thoughtful work,' and this he certainly carried out in his examination. He was sympathetic, kind, and cheerful, and this had its due effect upon the children.

ANSWERS TO ARITHMETIC.

STANDARD I.

1. 1,340. 2. 282. 3. 35.

STANDARD II.

1. 3,858.
2. 4,467,121.
3. 208.
4. 172,320.

STANDARD III.

BOYS.

1. £6,379 5s. 1½d.
2. £2,823 16s. 1½d.
3. 3,111 + 189.
4. 18s. 6d.

GIRLS.

1. £1,927 5s. 1d.
2. £339 17s. 8d.
3. 1,360 + 16.
4. 108.

STANDARD IV.

BOYS.

1. £35 3s. 4d.
2. 261,549 sq. ft.
3. 851 pk. 1 gal. 3 qt.
4. £8 19s. 8d.

GIRLS.

1. 19s. 10½d.
2. 162,232 min.
3. 1 ton 13 cwt. 18 lbs.
4. £8 8s.

STANDARD V.

BOYS.

1. 51 lb.
2. £3,311 7s. 4d.
3. 13 ml. 1 fur.
4.

s.	d.
10	0
8	9
2	11
18	9
£2	0 5

GIRLS.

1. 1,750 buttons
2.

£	s.	d.
0	4	4½
0	8	8½
1	12	4½
1	1	0
3	6	5½

3. £1,708 16s. 2½d.
4. $\frac{11}{28}$.

STANDARD VI.

1. 4$\frac{3}{4}$ per cent.
2. 24,950,000.
3. 50·778125.
4. $\frac{3}{40}$; ·525.

STANDARD VII.

1. £80.
2. £1 14s. 1$\frac{48}{50}$½d.
3. 1.40 p.m.
4. 4s.

—o—

SCIENCE NOTES.

M. SERPOLLET'S STEAM PHÆTON.—Considerable scientific interest attaches to M. Serpollet's steam phæton, lately exhibited for the first time in this country, though the use of such carriages on our high roads is practically interdicted by Act of Parliament. In the new invention, where the shafts of an ordinary phæton occur, there is a small steering wheel as in a tricycle. The driver sits in front at a handle-bar rising at an angle from this small wheel, and has absolute control over the movements of the vehicle. A twist is given to a little rod, then the iron lever beside the driver is pulled backwards and forwards half-a-dozen times, and the heavy wooden wheels begin to revolve. The engine (a two-cylinder, horizontal one of three horse power) drives a gear-wheel from whence a chain transmits the power to the driving wheel. The lever beside the driver serves to force the water into the boiler, which is composed of three coils placed one above the other, each coil being a flattened steel tube with an opening of from one sixteenth to one thirty-second of an inch; when entering into the first coil the water evaporates instantly, and by circulating through the two other coils the steam is super-heated up to some 300° F. The waste steam thus escapes as a colourless vapour, and as coke is the fuel consumed there is an entire absence of smoke. The average consumption of fuel is said to be 3 lbs. per mile, and of water 15 lbs. per mile, while the pace of the phæton varies from 13 to 20 miles an hour. One of M. Serpollet's phætons is being now driven constantly in and around Paris.

THE SENSES OF SPIDERS.—Mr. and Mrs. Peckham have recently contributed to the American Journal of Morphology some exceedingly interesting observations on the senses of certain American spiders. Spiders, it appears to them, possess a sense of smell. A slender glass rod, eight inches long, was held so that one end closely approached the individual under observation, then it was withdrawn, dipped in a strongly scented essence, and again held near the spider. Two hundred and twenty experiments were made on spiders belonging to twenty six species. Three species did not respond to the test. The others showed their perception of the scent in various ways — by movements of the legs, palpi, and abdomen, by shaking their webs, by running away, by seizing the rod and binding it up with web as they would an insect, and in the case of the *attidde*, by approaching the rod with the first legs and palpi held erect. Experiments as to the spiders' power of hearing were made by tuning forks. Spiders that weave webs, on their webs being touched by the tuning fork, were attracted by the buzzing and embraced the fork. When the fork was brought near a spider waiting in the centre of the web, she instantly dropped to some distance, hanging suspended by a silken thread. Gradually these spiders become callous to the sound of the fork vibrating near them, they let themselves down to a less distance when they fall, and after several trials cease to take any notice of the noise. Other spiders than those which weave webs, did not seem to take the slightest notice of the sound made by the tuning fork; but one of the *attidde* jumped to one side when "bang" was shouted in a loud voice, and when Mr. Peckham whistled, it stood on the tip of its abdomen, with its head held high, apparently in an attitude of attention. The sense of touch seems not to be highly developed in some spiders. The wolf-spiders carry about a bag of eggs enclosed in a silk coccon. Mr. Peckham substituted a pith ball of about the same size, for one of these cocoons. The spider to whom it was offerred took it between her jaws, tucked it under her body, and nursed it as if it were her own cocoon. With regard to sight, it was determined that about ten or twelve inches is a good long distance for a spider to see his mate. Spiders were also found to have colour preferences. By an arrangement of compartments of coloured glass, it was found that the spiders much preferred the red compartments, to either yellow, blue, or green. In two hundred and thirteen experiments the red box was selected a hundred and eighty-one times.

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THE MARINE BIOLOGICAL ASSOCIATION.—Some important work is now being undertaken at Plymouth by the Marine Biological Association of Great Britain. A thorough knowledge of the movement, migrations, and spawnings of fish, as well as the movements of their food, cannot, it is recognised, be obtained, except by the combination of biological and physical observations, — so indispensable, in this connection, is the consideration of the temperature and currents of the sea. The Association has therefore organised a scheme of work which, it is hoped, will eventually lead to the obtaining of some results valuable in practical fishing questions. Observations will be taken systematically in the Channel, and in the harbours and estuaries in the neighbourhood, with the view of following changes in temperature and density at different seasons of the year, and in different years. Efforts are also being made to interest fishermen in the subject, and to set them to make observations of surface temperature on the fishing grounds. Some of the extensive records of sea temperatures preserved in the Meteorological Office have been sent to Plymouth by the Meteorological Council for criticism and discussion, and it is hoped that the changes of temperature from month to month will be accurately determined, and will throw considerable light on the movements of various species of fish. In the tank room of the Laboratory, now open to the public six days a week on payment of a small charge for admission, the animals in the tank have been considerably affected by the severity of the past season, the mortality having been decidedly above the average.

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THE EFFECT OF URBAN FOG ON CULTIVATED PLANTS.—An interesting course of investigations has lately been undertaken by the Scientific Committee of the Royal Horticultural Society, on the effects of Urban Fog on plant life. After such dense and continuous fogs as we have unfortunately experienced during the past winter, a dropping of buds, a destruction of flowers, and a wholesale annihilation of the foliage of most tender soft-wooded stove-plants, have been observed to take place. At the close of the February fogs, scrapings from 20 square yards of the glass roofs of plant houses at Kew and at Chelsea were made, each of which yielded an almost identical amount of deposit, viz., 31 grains per square yard, or 6 tons per square mile. This deposit on being analysed by Dr. Bailey, of Owen's College, was found to consist of about 40 per cent. of mineral matter, 36 per cent. carbon, and 15 per cent. of hydrocarbons. There was present, also, from 2 to 3 per cent. of metallic iron in minute particles. The sulphuric acid — the chief agent of damage present in the London atmosphere — amounted to nearly 5 per cent., and the hydrochloric acid to 1½ per cent. The presence of such large quantities of volatile oils, accounts for the oleaginous character of the deposits formed from London smoke. The histological character of injured tissues, as exhibited by the microscope, have been carefully studied by Professor F. W. Oliver. and drawings and notes made. In the case of orchids, the distribution of the stomates seem to have a definite bearing on the distribution of the fog injuries. The action of the stomates here is probably to afford increased access of sulphurous acid to the part, which then directly attacks the soft, unprotected cells within. An attempt is now being made to estimate the influence of varying amounts of sulphurous acid gas and other poisons, upon the plant functions, transpiration, assimilation, and respiration. With regard to remedial measures, the placing of canvas over the plant-houses in foggy weather has been found to have a beneficial effect, the fog being thus partially filtered. Heat and the application of moisture to the roots of the plants are undesirable. In a long dark fog, heat and moisture stimulate absorption, and since the leaves are unable to throw off an excess of moisture as in summer weather the plants suffer. Sulphurous acid, too, acts more violently and immediately in a hot than a cool atmosphere.

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THE SMUTS OF CEREALS.—Mr. Tensen has recently published some investigations of considerable interest into the biology of the smuts affecting our cereals. He believes on biological grounds that there are at least two distinct species of *Ustilago* affecting barley. The commoner he calls *U. nuda* because the spores are almost naked, and are soon dispersed by the wind and weather, leaving only the bare rachis of the barley. The other, *U. tecta*, which is much less common, has its spores enclosed in a membranous capsule. They form much more compact masses and resist the disintegrating influences of the weather for a much longer period. The two species also differ in size and colour and their spores. Mr. Tensen also believes, on biological grounds, that the smuts of wheat, of barley, and of oats, are distinct species and incapable of infecting other than their proper host plants—that is to say, the smut of oats will not affect barley or wheat and *vice versa*.

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SUMMER SCHOOL OF SCIENCE AT EDINBURGH.—A most attractive programme of vacation lectures and practical teaching in Science subjects for the month of August, has been arranged this year by Professor Geddes of Dundee, and Mr. Arthur Thomson of Edinburgh. Men students are to be boarded at Edinburgh in a University Hall, and lady students in a separate hall, at the minimum rate of a guinea a week. A course of general biology is to be conducted in the forenoon, and classes in botany and zoology will be held in the latter part of the day. Practical knowledge of Zoology is to be obtained by visits to the Marine Station at Granton, on the Firth of Forth. A class ticket, admitting to all the courses, may be obtained for the moderate sum of three guineas, and pleasant excursions to the spots of classic interest near Edinburgh form part of the programme of the Association.

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LIQUEFACTION OF GASES.—M. Raoul Pictet, whose name is associated with the liquefaction of oxygen, has recently brought some interesting demonstrations of the liquefaction of gases before the Berlin Physical Society. As a first source of cold he uses 'Pictet's liquid,' a liquid mixture obtained by the pressure of carbonic acid and sulphurous acid. The cold produced in the volatilization of this liquid, and the application of four to twelve atmospheres, will liquefy nitrous oxide. The evaporation cold of the liquid nitrous oxide and a strong pressure (in the case of air amounting to two hundred atmospheres), are then used to liquefy oxygen, nitrogen, hydrogen, and atmospheric air. On the opening of the top of the vessel in which the liquefaction of air has taken place, the air escapes in a splendid blue jet, which immediately changes into a bluish cloud and then totally disappears. The temperature of the liquefied air is 200° C.

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DEATH OF PROFESSOR NÄGELI.—In the recent death of Professor von Nägeli, Science has lost one of the most energetic and formidable opponents of the scientific movement called forth by Darwin's work. He was a great microscopist. The light thrown by his researches upon the structure of the Vegetable cell, and the part played by protoplasm in its life history, initiated a distinct advance in biological science; and to his work morphology largely owes its scientific foundation. For more than thirty years von Nägeli was Professor of Botany and Keeper of the Botanical Museum and Garden in Munich.

NEW DICTATION TESTS.*

STANDARD V.

No. 1.

We then turned up a narrow shadeless path, bordered by stone walls, leading away from the sea, past a sugar-mill and a ruin. A few almond, castor-oil, and fig trees were growing amongst the sugar-canes, and as we mounted the hill we could see some thirty round straw huts, like bee-hives, on the sandy slopes beside the little stream. An abrupt turn in the mountains, amid which, at a distance of three leagues, this tiny river takes its rise, hides it from the sea, so that the narrow valley which it fertilises looks like a small oasis in the desert of rocks and sand.

No. 2.

If the art of embroidery in its application to binding is ever to come into fashion again, some lessons may be learnt from its similar employment in past times. And at the outset it may be said that it is only applicable within certain limits. Books chosen for decoration by needlework should be such as are not meant to be stood up in a bookcase, but rather intended to lie on a table or be kept in a case.

No. 3.

The wild cat, which is supposed by some naturalists to be the parent of the tame cat, is now found in this country only in the Highlands of Scotland. It lives in hollow trees, or in caves among the rocks. The head of this animal is triangular, its ears are rather long, and its body is of a stronger and more robust make than that of the tame cat. Its face is yellowish grey, with a band of black spots toward the nose; the whiskers are yellowish-white, the forehead is brown, and the head grey, marked with two dark stripes passing from the eyes over and behind the ears.

No. 4.

The wedger, raising his huge arms aloft, and bringing down his hammer deftly, crashes the great masses of coal in pieces, into lumps and cobbles and nuts. The labour is hard for all the getters, a prolonged strain of muscles and sight; and now and then, when the roof cracks—when Nature protests against the miner's trespass into its dark domain—when, to put it in collier's phrase, 'The weight is about,' the industry is not inseparable from peril. But it is better than idleness; and not without some sense of satisfaction.

No. 5.

The groundwork of the covers was always velvet, satin, or silk—mostly the two first—and of these, time has proved velvet to be decidedly the best and most suitable material, and silk the least durable of the three. Nothing is known of the history of velvet, whence it came, or what people made the fortunate discovery of its manufacture. It probably originated, as well as satin, in China; but the earliest places where it was made in Europe are all we know for a certainty, and these were the south of Spain and Lucca.

No. 6.

There were sundry false alarms of a start, as the horses arrived by ones and twos from the neighbouring villages, accompanied by their respective owners. By two o'clock all our steeds, twelve in number, had assembled, and in another quarter of an hour we were leaving the town by a steep stony path, bordered by low walls. There was no moon, and for the first two hours it was very dark. At the end of that time we could see the first glimmer of dawn, and were shortly afterwards able to distinguish each other and to observe the beautiful view which lay below us as we wended our way up and up between small patches of cultivation.

No. 7.

The spot where the entombed men were found was 600 ft. beneath the surface of the ground, and three-quarters of a mile from the mouth of the mine, and the hole in which their bodies lay was but 3 ft. wide, 3 ft. high, and about 4½ ft. in length. The foreman seized the man nearest to him and slowly dragged him towards the opening. The work was painful to a degree, the coal being rough and jagged, and the air vitiated, and it was quite dark as no lamp would burn.

No. 8.

There was not much wind during the night, and Palma was consequently still visible when I came on deck at daybreak. We had a light fair wind in the morning, accompanied by a heavy swell, which caused us to roll so much that I found it very difficult to do anything. Several shoals of flying fish skimmed past us along the surface of the water, occasionally rising to a considerable height above it. Their beautiful wings, glittering in the bright sunlight, looked like delicate silver filigree-work.

No. 9.

It follows, one would think, that the work should appear only on the upper side of the book, unless it is of so flat a nature as not to interfere with its recumbent position. It is true that nearly all the old embroidered covers were worked on both sides, but most of them are much more worn on the under side, the appearance of the whole being thus greatly marred by the discrepancy between the freshness of the two sides.

No. 10.

As we clattered up the paved streets, between vineyard and garden walls, 'curiosity opened her lattice,' on more than one occasion, to ascertain the cause of the unwonted commotion. The views on our way, as we sometimes climbed a steep ascent or descended a deep ravine, were very varied, but always beautiful. About half-way up we stopped to rest under a delightful trellis of vines, by the side of a rushing mountain stream, bordered with ferns; then leaving the vineyards and gardens behind us, we passed through forests of shady Spanish chestnut trees, beneath which stretched the luxurious greensward.

No. 11.

The larger gangway was finally reached and progress was now comparatively easy. The men were quickly transported to the bottom slope where the hoisting-car stood. They were placed in the car and raised to the landing above, where doctors were waiting, and where the rescued men remained for some hours under medical care before taking the remaining journey of half a mile to the surface. A great crowd waited at the mouth of the mine when the blackened, emaciated miners were brought to the top. They were taken at once to the Townhall upon stretchers, wrapped in blankets.

No. 12.

Mrs. Lingham was in a very good humour that day; a new dress had just been sent home, and fitted her perfectly; her husband had promised her a sealskin jacket, and an admiral, living in Mayfair, had invited them to dinner. She was a pretty, cosy-looking little woman; and as she sat in the arm-chair by the nursery fire, with the children round her, she seemed to be a complete impersonation of home peace. The comfortable room, with a great rocking-horse prancing in one corner, and a doll's house in another, was a cheerful refuge on a bleak, windy day.

No. 13.

We still have a light wind, right aft, accompanied by a heavy roll from the westward, which makes it impossible to sit anywhere with comfort, and difficult even to read. By 6 a.m. the sun had become very powerful, though its heat was tempered by the breeze, which gradually increased throughout the day, until, having set all our fore-and-aft canvas, as well as our square sails, we glided steadily along, in delightful contrast to the uneasy motion of the morning, and of the past few days. Under the awning, with the most heavily blue sky above, and the still darker clear blue sea beneath, stretching away in gentle ripples as far as the eye could reach—it was simply perfect.

No. 14.

I should like to say (remarks Mr. Grace) that good batsmen are born, not made; but my long experience comes up before me, and tells me that it is not so. There are gifts of eye and wrist which nearly all good batsmen possess in a greater or lesser degree that enable them to play certain strokes with great effect; but, to acquire all-round proficiency, I am strongly convinced that constant practice and sound coaching have all to do with it. I try to remember the time when I first handled a bat, and I can recall nothing but the advice that was drilled into me—stand well up to the wicket; keep your left shoulder well forward; practise constantly, and put your whole heart into it.

STANDARDS VI. & VII.

No. 1.

The loss is estimated at nearly one million dollars. Several hundred persons, who were in the museum at the time of the outbreak witnessing the various performances, became panic-stricken and wildly rushed to the stairs. The consequences of this stampede might have been very serious, but fatal results were prevented by the coolness of a policeman, who stationed himself at the head of the stairs with a drawn revolver and threatened to kill anyone refusing to obey his orders. All reached the street in safety, except a youth, who jumped from a window and was seriously hurt.

No. 2.

After seeing the people out of the building, Sheehy went up to the third floor and released scores of monkeys from their cages. The creatures scampered wildly about, and finally rushed upstairs, where they perished. The policeman reached the street with difficulty. The excitement among the 'freaks of nature' was pitiful. They were practically unable to help themselves, and it was only

* These 'Tests' and 'Composition Stories' are sold separately as '*Hughes's Unseen Reader*,' price 6d. per dozen, and may be ordered through any Bookseller.

with much trouble that they were restrained from throwing themselves from the windows. Mme. Carver, weighing 900 lb., was in the act of throwing her son, a small boy, who was exhibited as a midget, from a window, when the manager interfered and rescued them.

No. 3.

It might be a curious subject for inquiry whether, as there are personal equations among star observers, so there may be personal equations among nations—equations appertaining, that is to say, to the everyday ways of doing the same everyday things which prevail among the world's different peoples, as the result, not of the special circumstances under which they live or have lived, but of independent mental bent. If such an investigation should be now undertaken, it is certain that the personal equation of the Japanese *vis-à-vis* the Western and, indeed, all other races would be found to be a very appreciable quantity.

No. 4.

Japanese ways are in many respects unique. It is not necessary to put absolute faith in the legend that when the waiters of that country first made the acquaintance of bottles and corkscrews they were wont to twist the bottle on to the corkscrew instead of screwing the corkscrew into the cork. Nevertheless, you may see to this day, at almost any out-of-the-way country inn, a tendency in that direction which seems to lend some truth to the story. The little handmaid who puzzles over the problem of uncorking your claret or whisky has an evident leaning, until corrected, to solve it with the bottle.

No. 5.

When your cook bakes a cake in an ordinary cake tin, it is as certain that, if left to himself, he will serve it bottom upwards, and bottom sugared withal, as it is that the butler will open your tins of jam or pâté at the bottom instead of at the top. Japanese books begin at what we call the end. The lines are vertical instead of horizontal, the first being on the right hand edge of the page; and are read downwards from the top. The place for 'foot-notes' is at the top of the page, and that for the reader's marker at the bottom.

No. 6.

Letter writing, like book printing, advances by vertical lines from right to left, and is always on one side of one strip of paper, which is unwound from a roll as the writer proceeds, and cut off where he finishes. To fold the letter, it is doubled over and over from one end of the strip to the other. The postage stamp is affixed on the closed seal-flap of the envelope, instead of on its face. As for the mode of address, it is the exact reverse of ours. Thus, 'England, London, Printing House Square, *The Times* Office, The Editor,' would be the Japanese way of directing this letter.

No. 7.

People in Japan are called by the family name first, the individual, or what we should call Christian, name next, and then the honorific. 'Mr. Peter Smith' is in this country 'Smith Peter Mr.' The carpenter planes and saws towards instead of from him—the wrong way as we should say, yet his feats of planing are extraordinary. Japanese screws are left-handed, and Japanese locks work the 'wrong way.' At games of cards the dealer deals to the right, and the play goes round in the same direction. When travelling you fee the hotel servants soon after your arrival, instead of at departure.

No. 8.

Arrows are launched from the left side of the bow. Babies are carried on the back instead of in the arms. Candles are blown out with the hand or a fan, instead of by the breath. The bookkeeper enters his money figures first, his items below them. In place of the hot food and cold drinks in which we indulge at our dinners and luncheons, the Japanese lean to cold food and hot drinks. Sweets make their appearance early in the repast. Your host takes the lowest place. Crests are worn on the clothing, instead of being graven or painted on the household goods.

No. 9.

Horses are mounted from the right side, where also are all the harness fastenings. The mane is trained over the left side. In the stable the horse looks outward from his stall, and is fed from a bucket instead of a manger. The sail-cloths in Japanese craft are vertical instead of horizontal, and laced instead of sewn. When it is necessary to reef, the sail is reduced laterally by unlacing one or more breadths, instead of in its vertical dimension, as is the custom everywhere else.

No. 10.

Strange, too, in other respects are the ways of Japanese boatmen. They tow their boats stern foremost, and also haul them up stern foremost on the beach. In cold weather, even though on their muscular and splendidly-shaped bodies there be hardly enough clothing to swear by, you may at least be sure of their taking infinite pains to wrap up, of all features, their noses. In house-building the roof is the first part constructed, only to be taken to pieces again until the substructure is ready for it; and the best rooms, as well as the garden, are commonly at the back instead of at the front.

No. 11.

Less pronounced than the foregoing as evidences of 'personal equation' are many other Japanese habits and ways, which may be said to amount to peculiarities from the Western point of view. Japanese bathe, for example, in the afternoon or evening, instead of at rising, as we do. Our lower orders, it is to be feared, pay more attention to the cleanliness of their clothes than of their bodies. The reverse is the case with the lower orders of the Japanese—the most scrupulous bathers under the sun, even though their garments, in winter especially, be quite unworthy of their clean pumice-stoned bodies.

No. 12.

Small children of the poor, who have the gift of straying and no nurses to look after them, are safeguarded by the simple precaution of hanging labels round their necks which tell their names and addresses. A Japanese is said to be one year old on the last day of the year in which he is born; two years old on the very next day, *i.e.*, the first day of the new year; three years old on the succeeding New Year's Day; and so on. Hence we find the curious anomaly that a child born on the 31st of December is two years old the day after its birth.

No. 13.

In other respects also Japanese count of time differs from ours. From Tuesday to Friday, for example, is called four days instead of three, and year periods are similarly spoken of. Unlike the Western householder, who crams his saloons with all the art-objects he possesses, too often giving them the aspect of veritable show-rooms, the Japanese gentleman keeps the bulk of his treasures in a fireproof storehouse, taking out a few only—one or two for each room—at a time, and giving them place in the *tokonoma*, or raised recess, which is the place of honour in the apartment.

No. 14.

There, for a week, or may be a month, he dwells on their beauties with the undivided attention they deserve, and only replaces them by others when he has fairly gazed his fill. For pocket handkerchiefs the Japanese use little squares of clean paper, a bundle of which is carried in the girdle. Paper, again, takes the place of string, as you find out when the shopman ties together your purchases with a binding deftly rolled up from a strip of paper before your eyes. Paper also is commonly used for window panes in Japan, alone of all countries in the world.

No. 15.

As for Japanese beckoning, it is one of those things that 'no fellow can understand'—at, least, until he has had some experience—so much does the gesture resemble a warning to be off, instead of an invitation to advance. Two jinrikishas are approaching one another at speed. One of the men waves his hand to the right or left, and you take it as his signal of the course which the other is to follow. But you are in Japan, where it means, instead, the side he himself intends to take.

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NEW COMPOSITION STORIES FOR THE STANDARDS.

No. 1.

An Awkward Mistake.—An apothecary's boy was lately sent to leave at one house a box of pills, and at another six live fowls. Confused on the way he left the pills where the fowls should have gone, and the fowls at the pill place. The folks who received the fowls were astonished at reading the accompanying directions: Swallow one every two hours.

No. 2.

A Smart Answer.—A boy at of much earlier age than is customary to take children at large schools, only six years old, was going into the village without leave, when one of the masters called after him, 'Where are you going, sir?' 'I am going to buy a halfpennyworth of nails, sir?' 'What do you want a halfpennyworth of nails for?' 'For a halfpenny, sir,' replied the urchin.

No. 3.

A Dog's Instinct.—A few years since, the ear of a dog belonging to a man living near Stourbridge was severely hurt, and the animal was taken to a chemist's shop, where the wound was dressed.

During three days, the dog was regularly conducted to the shop by his master; but on the fourth morning he found his way there alone, leaped on the counter, and waited till the ear was dressed. This visit he repeated every morning until his ear was wholly healed.

No. 4.

ACTING IN HASTE.—A gentleman in Penrith, whose house is much infested with beetles, got out of bed one night last week, and, after killing several, lay down again. He had scarcely got into a slumber, when he found under his head something that he imagined to be a beetle, which he seized with a shudder, and threw across the room with great violence. He then discovered, but too late, that the supposed beetle was his watch-seal, and that he had broken his watch to pieces by throwing it against the wall.

No. 5.

ANECDOTE OF A SPARROW.—The knavery of the sparrow was curiously exemplified some few weeks ago. The ladies of the mansion had laid out a number of lace cuffs to dry and whiten; but when the time arrived for taking them up, one of the most valuable pieces, about three feet long, was missing, and could not be found anywhere. In the beginning of the month, the gardener, in pruning a large pear tree against the wall, destroyed a number of nests—when, in one of them, was found the identical cuff, neatly coiled round the inside!

No. 6.

AN IRISHMAN'S MISTAKE.—Samuel Lover once told a good anecdote of an Irishman giving the pass-word at the battle of Fontenoi, at the time Saxe was Marshal. 'The pass-word is Saxe, now don't forget it,' said the Colonel to Pat. 'Faith! and I will not, was not my father a miller?' 'Who goes there?' cried the sentinel, after he arrived at the post. Pat looked as confidently as possible, and in a sort of whispered howl replied 'BAGS, your honour.'

No. 7.

ANECDOTE OF WATERLOO.—During the battle a British artillery officer rode up to the Duke of Wellington, and said, 'Your Grace, I have a distinct view of Napoleon, attended by his staff; my guns are well pointed in that direction, shall I open fire?' The duke replied, 'Certainly not, I will not allow it; it is not the business of commanders to fire on each other.'

No. 8.

ANECDOTE OF WATERLOO.—Towards the close of the day, made ever memorable by this glorious victory, and just previous to the final and decisive charge of the British, the remains of that gallant corps, the Scots Greys, took up a position close to another regiment of horse that had also suffered severely. A young Irish officer, recognising a friend in the Greys, immediately shouted out in a gay tone, 'How are you, Mac?'

'Ugh! as well as I can be, after such butchering work as we've had,' answered the gallant Scot; 'I'm thinking just now of my poor mother and sister in Edinburgh.'

'By the powers, darling!' exclaimed the reckless Hibernian, 'and I'm thinking what a tremendous nervous state *my tailor* would be in if he knew where I was at this moment.'

No. 9.

THE IRISH PLOUGHMAN.—A recent emigrant had applied for employment to a farmer, and being asked if he was acquainted with all sorts of farm labour, replied without hesitation in the affirmative. He was accordingly engaged, and the next morning sent to 'hold the plough,' with the son of his employer to drive. After the horse was tackled in, the boy gave him a start; but, hearing an exclamation behind, turned and beheld the son of the green isle ploughing up the ground with his heels, which were firmly set, while he was straining every muscle to maintain his position, and crying out, 'Stop! stop! how can I *hould* the plough, if you make the horse drag it away from me?'

No. 10.

AN OLD WAITER.—The waiter was an ancient man bent nearly double, with a few hairs, of a pepper and salt tint, scattered about his head. His cuffs hung over his hands, and no one could see into what obscurity the ends of his dingy white neckcloth retired after their mission of forming a knot had been accomplished. The soles of his shoes and the oil-cloth of the coffee-room had worn out one another for thirty or forty years; so that he was old in the service when Gudge had first met him; for he was the same Bob. And since then he had never but once had a holiday, which he had passed in the coffee-room of an adjacent hotel, going to see a brother waiter, and folding the napkins and filling the cruets for him, against a large dinner which was coming off next day; the pleasantest few hours, as he afterwards asserted tha ever he remembered to have passed.

No. 11.

SAGACITY OF A DOG.—Nine years ago a postmaster trained a dog, of the bull-terrier breed, to fetch from the guard of the Bath mail, as it passed through the village, the bag of letters. On the guard sounding his horn, the dog would leave the office and meet the mail; and when the guard dropped the bag, he would bring it safe to the office. From his sagacity and faithfulness, a collar was given him with the following inscription:—'Mungo, guard of the mail-bag.' Many gentlemen and passengers have witnessed his performance during eight years. On Tuesday last the mail was taken off the Plymouth road; the dog was in waiting for the bag at the usual time, but no mail arrived; and he has been apparently in great distress ever since. He may be seen every day waiting and walking up and down the road, and will not leave the accustomed spot.

No. 12.

YORKSHIRE WIT.—A Yorkshire boy went into an inn, where a gentleman was eating eggs. The boy looked extremely hard at him for some moments, and then said, 'Will you be good enough to give me a little salt, sir?' 'Aye, certainly, boy; but why do you want salt?' 'Perhaps, sir,' said he, 'you'll ask me to eat an egg presently, and I should like to be ready.' 'What country are you from, my lad?' 'Yorkshire, sir.' 'I thought so—there, take an egg.' 'I thank you, sir,' said the boy. 'Well,' added the gentleman, 'they are all horse stealers in your country, are they not?' 'Yes,' rejoined the boy, 'my father (though an honest man) would no more mind stealing a horse than I would drinking your glass of ale. Your health, sir,' said he, and drank it up. 'That will do,' says the gentleman, 'I see you're genuine Yorkshire.'

No. 13.

AN INGENIOUS ESCAPE.—Two sportsmen, one of them furnished with a license and the other not, were last week out with their guns near Lyons, when a game-keeper was seen a little distance coming towards them. The unlicensed man became alarmed, and was about to fly; when his companion prevailed on him to stand his ground, engaging to bring him harmless out of the scrape. When the game-keeper came within a certain distance, he with the permit set off at the top of his speed, over hedge, over ditch, in true steeplechase style, leaving his friend immovable with astonishment. The game-keeper at once concluded that the fugitive had good reasons for his flight, and followed him till, at a considerable distance, the flying sportsman stopped and allowed him to come up. As soon as the game-keeper had recovered breath enough to speak, he demanded the other's license. This was produced, examined, and found to be perfectly regular. Disappointed and vexed, the game-keeper, in no very good humour, asked the bearer of it why he had fled so fast. The answer was, 'Only to stretch my legs!' To this there was no reply. In the meantime the unlicensed gentleman turned in the opposite direction, and reached home unmolested.

No. 14.

A MILKMAN'S CONFESSION.—A German had made a fortune abroad by selling milk. He started home with two bags of sovereigns. On shipboard, he counted one bag of treasure. A mischievous monkey was watching his operations. As soon as it was replaced and tied up, and the other bag emptied, Jacko snatched up the full one, and was soon at the mast-head. He opened the German's bag, and after eyeing the pretty gold, he proceeded to drop one piece upon the deck, and another in the water, until he had emptied the bag. When he had finished, the Dutchman threw up his hands, exclaiming, 'He must be a spirit, for what came from the vater he does give to the vater, and what came from the milk, he gives to me.'

No. 15.

A SHREWD SMUGGLER.—Eighteen smugglers, each carrying a sack of gunpowder, were travelling along a rocky furrow. The last of the file perceived that his sack diminished sensibly in weight, whereat he was quite disposed to rejoice, when it occurred to him to suspect shrewdly that the lightening of the load arose possibly from the decrease of its bulk. It was but too true: a long train of powder appeared on the track he had pursued. This was a loss in the first place; but what was worse, it was a token which might betray the march of the band, and jeopardise its business. He cried halt; and thereupon his seventeen comrades sat themselves down, each on his sack, to drink a drop, and wipe their faces. Meanwhile, the other, the shrewd one, retraced his steps till he came to the end of his train of gunpowder. He reached it after two hours' walking, and set fire to it with his pipe, in order to destroy the clue. Two minutes afterwards he heard a superb explosion, which, sounding from the rocky mountain walls, rolling through the

valleys, and ascending the gorges, caused him a marvellous surprise: it was the seventeen sacks which had been fired by the train, and had bounced into the air, carrying with them the seventeen fathers of families that were seated on them.

No. 16.

THE DENTIST AND THE RAKE.—A dentist, whose skill at teeth pulling is well known, was recently met by a noted wag, who was carrying an old garden-rake in one hand, while he held the other to his face, which wore the lugubrious expression which the jumping tooth-ache is so well calculated to produce on the sufferer. 'Doctor,' says he, 'I want you to pull a couple of teeth for me.' 'Very well,' replied the doctor; 'just step into my office and I'll relieve you. There,' continued he, as they entered, 'take a seat in that chair, and show me the teeth you wish extracted.' 'Well, doctor,' says the wag, holding up the rake, 'I want you to pull these two broken teeth out of this rake!' For a moment the doctor was thrown off his guard by the joke that had been played upon him; but soon recovering himself, replied, 'Well, let me have it—I might as well take the teeth from one rake as another.'

No. 17.

HONESTY OF A GERMAN FARMER.—In Germany, during the war, a captain of cavalry was ordered out upon a foraging expedition. He put himself at the head of his troop, and marched to the quarter assigned him. It was a lonely valley, in which one could perceive hardly anything but woods. Finding in the midst of them a small cottage, he approached and knocked at the door, which was opened by an old and venerable man, with a beard silvered by age. 'Father,' said the officer, 'show me a field where I may set my troop to foraging.' The old man complied and conducting them out of the valley, after a quarter of an hour's march, came to a fine field of barley. 'Here is what we are in search of,' exclaimed the captain. 'Father, you are a true and faithful guide.' 'Wait a few minutes more,' replied the old man, 'follow me patiently a little further.' The march was accordingly resumed, and at the distance of a mile they arrived at another field of barley. The troop immediately alighted, cut down the grain, trussed it, and remounted. The officer then said to his conductor, 'Father, you have given yourself and us unnecessary trouble; the first field was better than this.' 'Very true, sir,' replied the good old man, 'but it was not mine.'

No. 18.

OBEDIENCE OF THE DOG.—A short time ago a gentleman living in Buckingham took his dog into a field where some sheep were grazing. The animal is a sheep-dog, and one of more than ordinary tractability and intelligence. The gentleman remembers having pointed to a corner of the field, saying to his dog, 'Lie there till I come back.' He afterwards forgot having issued such an order. That night and the following morning nothing was heard of the dog. On the following day it was reported to his master that the missing animal was in a distant field, out of which he could not be coaxed nor driven. It immediately occurred to the master that he had given the before-mentioned command to his obedient companion and servant. Mounting his nag, he hastened to the spot, and there, sure enough, was the dog, who at once saw a prospect of release, and, by his caresses, showed how delighted he was to escape from duty, jogging home blithely and happily, after fasting more than twenty-four hours. There is no telling how long he would have remained at his appointed post, but for his timely rescue.

No. 19.

A LOST NOTE.—In 1740 a Bank director lost a £30,000 bank note, which he was persuaded had fallen from the chimney-piece of his room into the fire. The Bank Directors gave the loser a second bill, upon his agreement to restore the first bill, should it ever be found, or pay the money if presented by any stranger. 'About thirty years afterwards, the director having been long dead, and his heirs in possession of his fortune, an unknown person presented the lost bill at the Bank, and demanded payment. It was in vain that they mentioned to this person the transaction by which that bill was annulled; he would not listen to it; he maintained that it had come to him from abroad, and insisted upon immediate payment. The note was payable to bearer, and the £30,000 were paid him. The heirs of the director would not listen to any demands of restitution, and the bank was obliged to sustain the loss. It was discovered afterwards that an architect having purchased the director's house, had taken it down, in order to build another upon the same spot, had found the note in the crevice of the chimney, and made his discovery an engine for robbing the bank.

No. 20.

HELPING HIMSELF.—Some years ago a countryman, unused to the ways of London life, paid a visit to the Metropolis. Being in want of refreshment he entered an hotel and seated himself at the dinner table, opposite to a gentleman who was indulging in a bottle of wine with his dinner. Thinking the wine to be common property, the innocent countryman helped himself to it with the gentleman's glass. 'That's cool!' exclaimed the owner of the wine, indignantly. 'Yes,' said the countryman, 'I should think there was ice in it.'

No. 21.

GUN COTTON IN INDIA.—At a large party assembled at the table of the English general at Bangalore, a small portion of gun-cotton, forwarded from the Isle of Wight by a chemist, and which had been carefully preserved, was handed up. Every eye was fixed upon the general, expecting that he would at once take means to try an experiment; but, to the disappointment of the whole party, but still somewhat to its amusement, the general, we suppose thinking the matter too serious for dinner deliberation, coolly put the explosive cotton under his plate, so as to be secure. In less than two minutes a sort of puff was heard, and the general's plate and its contents were scattered over his splendidly dressed guests, to their no small consternation; but on discovering that no harm had followed other than the effects of the musky shower, 'the whole table was set in a roar.' The explosion no doubt was attributable to the heat of the plate.

No. 22.

COOLNESS OF A SPANISH ROBBER.—The Valencia diligence was robbed a few days ago near that city. The chief of the thieves seems to have been quite an orator. The passengers not having produced of their own accord sufficient to satisfy his demands, he represented, with the air of a man defrauded of his dues and treated shabbily, that really this was a very small number of watches for so respectable a party; and that, however much it went against his grain to commit anything in the shape of violence, the principles of duty would force him to proceed to commit a few little atrocities, unless the gentlemen present consented to conduct themselves in a handsomer manner. This dignified appeal to the consciences of the passengers did not fail of producing an effect. They searched their trunks and pockets a second time with more diligence. Some ounces of gold, some jewels, that had escaped their attention at first, were drawn forth to light, and handed over to the bandit. He was contented with this supplementary addition to the spoils, and refrained from the little atrocities he had reluctantly been obliged to throw out a hint of; nevertheless (said he), he could not refrain from observing that it was always safer, as well as more becoming, upon these occasions, to speak the truth at once.

No. 23.

THE BUTCHER AND THE LAWYER.—A butcher, in a provincial town, called the other day upon his friend the lawyer, to consult him upon the following point:—A lady had just been in his shop buying a choice bit of beef for her worthy husband's dinner. Her pet dog, which accompanied her, forgetting its good manners in the shop, had, either in snuffing at or tasting a nice roast, tumbled it among the sawdust wherewith the floor was strewn, and soiled it. His question to the lawyer was, 'Is this lady bound to pay me for and receive the said roast?' and if so, how may payment be enforced?' The lawyer inquired if the lady was a good customer; and being answered in the affirmative, he said, 'My advice to you as a friend would be, not to enforce payment of the 7s. 6d. (for that was the full value of the roast), because, if you do, you will most likely lose the family's custom, and that of some of their friends. But, when the lady's husband looks in, you may take an opportunity of mentioning the circumstance to him, in as gentle and polite a way as you can, and very probably he will pay it at once.' 'I dare say you're right; I'll just follow your advice, and take the liberty of telling you the lady was your own wife.' The lawyer gave a good-natured laugh, put his hand in his pocket, and paid the 7s. 6d. The butcher went away in great glee; for he was proud of his shrewdness in *doing* the lawyer. In his exultation he hurried to his neighbours, the confectioner, the grocer, and the apothecary, to tell them of the capital joke; and great was the chuckling of these cronies over it. The butcher's dreams that night was pleasant, and on the morrow his temper was placid and serene: he mused of spending the half-crowns in treating the grocer, confectioner, and apothecary. While in this delighted mood, the postman handed him a note. It was from his friend, the lawyer, and contained an account:—'A. debtor to D.—To consultation, £1 1s.!'

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